



United Nations
International Strategy for Disaster Reduction

International Fire Aviation Working Group

DRAFT

Fire Aviation Guidelines

Part 2

International Manual of Common Rules for Fire Aviation

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This International Manual of Common Rules (IMCR) forms Part 2 of the Fire Aviation Guidelines. The purpose of the IMCR is to provide more detailed guidance for implementing the principles and strategies outlined in Part 1 of the Fire Aviation Guidelines (the Framework document).

This document is intended to be able to stand alone, however the reader will find background and contextual information as well as key definitions in Part 1 of the Fire Aviation Guidelines..

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A. INTRODUCTION

A.1. Context

This International Manual of Common Rules (IMCR) forms Part 2 of the Fire Aviation Guidelines. The IMCR provides key guidance and further detail required to implement the core principles and basic strategies of the Fire Aviation Guidelines, and sets out recommended doctrine for the development and maintenance of fire aviation capability.

This IMCR is intended to be able to stand alone as a reference document, however background, contextual information, disclaimers, copyright information, references and key definitions will be found in the Fire Aviation Guidelines Framework document.

It is generally intended that individual jurisdictions will incorporate the material from these guidelines into their own internal doctrine as appropriate. Similarly, it is envisaged that Aircraft Operators will incorporate appropriate provisions from these guidelines into their own policy, procedure and operational manuals.

Countries and aircraft operators that already have well developed fire aviation doctrine may find these guidelines a useful checklist for ensuring their existing material is suitably comprehensive.

The IMCR is intended to be a living document that will be added to and revised as operational and management procedures and practices are developed, improved and refined.

A.2. Structure of the IMCR

The IMCR is divided into sections:

Section A **Introduction**

Section B **Key Standards and Recommended Practices**

This section provides key high-level guidance regarding fire aviation practices.

Section C **Cooperative arrangements**

This section provides guidance regarding inter-jurisdictional cooperation and resource sharing.

Section D **Practice Guides**

The Practice Guides provide more detailed information to assist with implementing the key standards and recommended practices.

A.3. Definitions, Acronyms and Abbreviations

Definitions, acronyms, and abbreviations used in the IMCR are provided in Part 1 of the Fire Aviation Guidelines, the Framework document.

A.4. Terminology

In this IMCR, including the Practice Guides, 'Standards' are specified systems, policies, programs, processes, and procedures that are considered an operational necessity, and with which an agency or aircraft operator would be expected to conform. Standards contain the action word "must" (e.g., "The Aircraft Operator must have a process..."). Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements will normally be required to conform to these Standards.

'Recommended Practices' are specified systems, policies, programs, processes, and procedures that are desirable. Recommended Practices contain the action words "should" or "recommended" (e.g., "The Aircraft Operator should have a process..."). Bi-lateral or multi-lateral resource sharing agreements may still require conformance to these practices, at the discretion of the States involved.

B. KEY STANDARDS AND RECOMMENDED PRACTICES

B.1. Fire Agency

B.1.1. Safety and culture

- a. The Fire Agency must have an active safety culture, where:
 - i. the overriding importance of safe operations is promoted and communicated throughout the organisation;
 - ii. all personnel conduct operations to the highest standards of safety as a matter of routine;
 - iii. all personnel strive to improve safety;
 - iv. personnel 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.

B.1.2. Aviation safety programs

- a. The Fire Agency must have specific, defined aircraft safety programs that:
 - i. clearly define organisational and management commitment to safety;
 - ii. have effective mechanisms for promotion of aviation safety throughout the organisation;
 - iii. provide quality controlled processes for communication of safety related information;
 - iv. include processes for reporting safety issues that encourage personnel to report issues;
 - v. identify, investigate and rectify safety issues.
- b. The Fire Agency should have specific, defined aircraft safety programs that:
 - i. investigate safety related issues in a non-punitive manner;
 - ii. communicate findings, recommendations and lessons learnt from safety investigations to other organisations.

B.1.3. Resource planning and allocation

- a. The Fire Agency should have in place processes that ensure as far as practicable that the capability, capacity and deployment of aerial means is appropriate, within budget and resourcing constraints, and is consistent with the type of fire management experienced in the agency's jurisdiction. Consideration should be given to factors such as, for example:

- i. overall wildfire threat;
 - ii. availability of alternative means;
 - iii. vegetation fuel types;
 - iv. terrain and orography;
 - v. availability of water and types of water source.
- b. The Fire Agency should have in place systems that:
- i. ensure properly considered decisions regarding the readiness of aircraft to respond to wildfire emergencies, including consideration of the:
 - A. most suitable readiness location for the aircraft; and
 - B. time required between notification and the aircraft's response to the notification.
 - ii. allocate and dispatch aircraft to wildfire emergencies, considering factors such as:
 - A. relative priority of each wildfire emergency;
 - B. probability that the use of aircraft will be successful in meeting the fire management objectives;
 - C. capacity of the aircraft to safely, effectively and efficiently undertake the required tasks.

B.1.4. Management, support and supervision

- a. The Fire Agency must have in place processes that provide sufficient competent personnel to activate, manage, supervise and support fire aviation operations.
- b. The Fire Agency must establish:
 - i. effective systems to determine clear objectives, tasks and expected outcomes for aerial resources;
 - ii. effective systems to communicate objectives, tasks, expected outcomes and other relevant operational information, to aerial resources.
- c. The Fire Agency must have in place management systems and resources to:
 - i. provide overall governance for the use of aircraft in support of fire management activities;
 - ii. develop and administer governance arrangements, doctrine, policies and procedures;

- iii. administer procurement arrangements and service agreements with Aircraft Operators;
- iv. develop and manage support systems and infrastructure as required.
- d. The Fire Agency must have in place systems to:
 - i. manage, task, supervise and support the operation of aircraft at fire incidents and in fire management activities (refer to B.4.1 on page 17).
 - ii. co-ordinate the operation of aerial means across multiple incidents or incident management organisations, for example through a Regional or State Coordination or Command Facility. Coordination functions should include an assessment of relative priorities and resource allocation.

B.1.5. Mobilisation of resources

- a. The Fire Agency should have in place systems that:
 - i. ensure aircraft are mobilised (dispatched) to tasks in a timely manner, without unnecessary delays;
 - ii. ensure the most appropriate aircraft resources are mobilised and allocated to required tasks;
 - iii. mobilise appropriate supervision and support for the aircraft operation.

B.1.6. Integration

- a. The Fire Agency should have in place systems and procedures that ensure aircraft operations properly integrate with ground-based operations, extending to:
 - i. training and familiarisation of aviation personnel with Fire Agency operating procedures;
 - ii. training and familiarisation of Fire Agency personnel with aircraft operating procedures and aircraft capabilities and limitations;
 - iii. provision of appropriate communications systems;
 - iv. provision of a communications planning template.

B.1.7. Aircraft Operator relationships

- a. The Fire Agency should have in place processes to ensure a contract or service agreement is executed with the Aircraft Operator. The contract or agreement should stipulate the fire aviation services to be delivered and provide clear specifications regarding the expected standards of service delivery.

- b. The Fire Agency must have in place processes to audit and monitor the standards of safety of the services provided by the Aircraft Operator.
- c. The Fire Agency should have in place processes to monitor and audit the performance and overall service standards provided by the Aircraft Operators. The audit processes should incorporate a provision for feedback and guidance regarding performance improvement.

B.1.8. Evaluation and improvement

- a. The Fire Agency should have in place clear performance measures for the effectiveness and efficiency of Fire Aviation.
- b. The Fire Agency should have in place processes to monitor, evaluate and analyse the effectiveness and efficiency of Fire Aviation against measurable performance standards.
- c. The Fire Agency should have a program of research and development aimed at improving the overall safety, efficiency and effectiveness of Fire Aviation.

B.1.9. Doctrine

- a. The Fire Agency must have a system of records that incorporates doctrine, policies, procedures, processes and systems for Fire Aviation.
- b. The Fire Agency's system of records should be managed to ensure:
 - i. regular review and updating of documents;
 - ii. identification and control of document versions;
 - iii. appropriate distribution of current versions of relevant documents.

B.1.10. Support systems

- a. The Fire Agency must ensure that appropriate systems, procedures and resources are in place to properly support aviation operations. Support systems required include:
 - i. appropriate systems for reliably communicating with aircraft;
 - ii. 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");
 - iii. procedures for producing an accurate manifest of the names of each person on board any aircraft conducting operations for the Agency,
 - iv. procedures for providing logistic support to aircraft operations including, where required, the provision of consumables.

- b. The Fire Agency must have in place suitable systems for documenting aircraft activities, along with processes for archiving and retrieving records of fire aviation activity.
- c. The Fire Agency must have in place administrative systems, where applicable, for determining, verifying and governing appropriate payments to Aircraft operators for services provided.

B.1.11. Environmental

- a. The Fire Agency 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:
 - i. procedures for safe handling of aviation fuels and lubricants;
 - ii. procedures for safe handling of fire retardants and suppressants;
 - iii. “good neighbour” practices to minimise the adverse effects of aircraft noise.

B.1.12. Chemicals

- a. Where a Fire Agency permits the use of aerially applied chemical fire suppressants and retardants, the agency must have in place suitable policies and procedures to govern their application, specifying in particular:
 - i. appropriate suppressants and retardants to apply in particular circumstances, considering factors such as suitability to meet control objectives, relative effectiveness, fire behaviour, vegetation, terrain and potential environmental impacts;
 - ii. controls to minimise the risk of unwarranted adverse or unintended effects;
 - iii. safe procedures for handling, storing and preparing chemicals for use.
- b. Where a Fire Agency permits the use of aerially applied chemical fire suppressant and retardants, the agency must have in place a system for approving the use of each chemical. The approval system should include consideration of, at a minimum:
 - i. potential impacts on human health;
 - ii. environmental effects;
 - iii. effects on the airframe and components of the delivery aircraft;
- c. the chemical approval system referred to above should also prescribe:
 - i. permitted uses of each chemical;
 - ii. appropriate concentrations of diluted chemicals to apply in particular situations;

- iii. restrictions regarding the use of each chemical;
- iv. aircraft types and drop systems from which each chemical may be dispensed;
- v. where required, appropriate controls and risk reduction strategies for deleterious effects.

B.1.13. Emergency response planning

- a. The Fire Agency must have in place plans and procedures to respond to emergency situations involving fire aviation, including but not limited to:
 - i. missing or overdue aircraft;
 - ii. reportedly crashed aircraft;
 - iii. crashed aircraft.

B.2. Aircraft Operator

B.2.1. Safety and safety culture

- a. The Aircraft Operator must have an active safety culture, where:
 - i. the overriding importance of safe operations is promoted and communicated throughout the organisation;
 - ii. all personnel conduct operations to the highest standards of safety as a matter of routine;
 - iii. all personnel strive to improve safety;
 - iv. all personnel 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.

B.2.2. Aviation safety programs

- a. The Aircraft Operator must have specific, defined aircraft safety programs that:
 - i. clearly define organisational and management commitment to safety;
 - ii. establish effective mechanisms for the promotion of safety throughout the organisation;
 - iii. provide quality controlled processes for communicating of safety related information;
 - iv. include processes for reporting safety issues and that encourage personnel to report issues;

- v. identify, investigate and rectify safety issues.
- b. The Aircraft Operator should have specific, defined aircraft safety programs that:
 - i. investigate safety related issues in a non-punitive manner;
 - ii. communicate findings, recommendations and lessons learnt from safety investigations to other organisations;
 - iii. incorporate appropriate risk assessments and controls, including in the application of dynamic risk management in operations where situational factors are constantly changing..

B.2.3. Management systems

- a. The Aircraft Operator must have in place comprehensive, effective organisational management systems.

B.2.4. Aircraft maintenance and airworthiness control

- a. The Aircraft Operator must have in place effective organisational systems to ensure that the airworthiness of the aircraft is maintained and that aircraft maintenance is carried out as required.

B.2.5. Flight operations management

- a. The Aircraft Operator must have a valid Air Operators Certificate or equivalent document issued by the State that authorises the operator to conduct fire aviation operations in accordance with specific conditions or limitations.
- b. The Aircraft Operator must have in place effective systems for the management and support of flight operations.

B.2.6. Aircraft dispatch

- a. The Aircraft Operator must have in place systems and procedures to efficiently dispatch aircraft to undertake task for the Fire Agency and that assures the safety of all flight operations.

(note: for the avoidance of confusion, “dispatch” in this context refers to the Aircraft Operator’s internal flight dispatching function, as distinct from a Fire Agency’s mobilisation of an aircraft or request for an aircraft to proceed to undertake a task.)

B.2.7. Security

- a. The Aircraft Operator must have a formal security program that:
 - i. effectively prevents security risks such as unlawful or inappropriate interference with aircraft; and
 - ii. assures conformance with the requirements of the any aviation security program of the State or applicable requirements of other states where operations are conducted.

B.2.8. Ground handling

- a. The Aircraft Operator must have in place effective organisational systems to ensure control of ground handling operations and appropriate procedures for ground handling of aircraft that will ensure safety and security.

B.2.9. Emergency response planning

- a. The Aircraft Operator must have in place plans and procedures to respond to emergency situations involving fire aviation, including but not limited to:
 - i. missing or overdue aircraft;
 - ii. reportedly crashed aircraft;
 - iii. crashed aircraft.

B.3. Aircraft

B.3.1. Maintenance and airworthiness

- a. The Aircraft Operator (in conjunction with the Fire Agency, where appropriate) must ensure that any aircraft utilised in Fire Aviation is structurally appropriate for the specified tasks, taking into account factors such as:
 - i. meteorological conditions likely to be encountered;
 - ii. magnitude, extent, pattern and frequency of stresses and loadings likely to be encountered on the airframe and airframe components during fire operations;
 - iii. modifications made to the aircraft;
 - iv. any additional equipment attached to the aircraft.
- b. The Aircraft Operator must have procedures to ensure that aircraft all aircraft are operated within the flight envelope limits that are prescribed to ensure structural integrity of the aircraft.
- c. For aircraft involved in firebombing operations (or other operations as appropriate) the Aircraft Operator should have a program of automatically monitoring airframe stresses and loadings to ensure that the aircraft continues to be operated within prescribed limits and to detect any exceedances requiring rectification action.
- d. As per B.2.4, above, the Aircraft Operator must ensure that the airworthiness of the aircraft utilised in fire operations is maintained and that aircraft maintenance is carried out as required.
- e. Where appropriate (generally where the airframes of aircraft are greater than 15 years old) the Aircraft Operator should implement formal program to assure the continuing airworthiness of aircraft that may be utilised for fire operations. Such a program should, at a minimum:

- i. comply with any requirements of the State in which the aircraft is registered;
- ii. comply with any relevant requirements of the aircraft manufacturer;
- iii. monitor the aircraft for issues known to develop on older aircraft, such as:
 - corrosion damage;
 - widespread fatigue damage;
 - longer-term fatigue damage to airframe structural components;
- iv. apply appropriate modification factors to service-life limits of airframe and mechanical components (for example due to the additional or repeated stresses involved in some fire aviation operations it may be appropriate to limit the life of an airframe or particular components to a shorter life than may otherwise apply).

B.3.2. Aircraft equipment

- a. Aircraft used in Fire Aviation should carry the following equipment and material:
 - i. survival equipment appropriate for the number of people carried and suitable to the conditions in which the aircraft is operating;
 - ii. survival water and rations appropriate for the area of operations and the number of people carried;
 - iii. at least one crash-activated electronic locator beacon capable of transmission for satellite reception on 406 Mhz, and which transmits an embedded position of the aircraft; and
 - iv. at least one Personal Locator Beacon capable of transmission for satellite reception on 406 Mhz and which may be operated independently of the aircraft; and
 - v. other equipment that may be required by the Fire Agency in order to carry out the required tasks safely and efficiently.
- b. Where aircraft used in Fire Aviation are flown routinely at low level (below 500 feet or 150 metres Above Ground Level) the Fire Agency and Aircraft Operator should jointly undertake a risk analysis to determine whether the aircraft must be equipped with an appropriate Wire Strike Protection System.
- c. The Aircraft Operator must ensure that any task or mission specific equipment fitted to the aircraft is approved for use in the aircraft by the relevant authority; and that the method of fitting the equipment to the aircraft is approved by the relevant authority.
- d. The Aircraft Operator must ensure that any task or mission specific equipment fitted to the aircraft is properly maintained, is fully operational and that the maintenance history is recorded.

- e. The Fire Agency must ensure that any aircraft task or mission specific equipment owned or controlled by the Fire Agency is properly maintained, is fully operational and that the maintenance history is recorded.

B.4. Air operations management

B.4.1. Management structure

- a. The Fire Agency must have in place clear, defined and robust systems to manage and support the operation of aircraft at fire incidents and in fire management activities, as part of the overall Incident Management Organization. It is recommended that the management system be based on the Incident Command System (ICS). ICS provides for an Air Operations Branch, which in turn is divided into an aviation tactical group and an aviation support group.
- b. The Fire Agency should ensure that all participating and co-operating agencies and organisations (including Aircraft Operators) are able to operate within the defined operations management structure by either:
 - i. using that management structure in field or regular work or in training exercises; or
 - ii. being additionally trained to use the defined management structure when cooperating with the Fire Agency; or
 - iii. fulfilling a defined role under the close supervision of Agency personnel fully trained in the management structure.
- c. The Fire Agency must ensure that at no stage during operations will confusion or disputes or develop concerning the authority or chain of command. This is particularly important during operations conducted across jurisdictional or organisational boundaries (e.g. private / public land, Fire Agency / Police authority).
- d. The Fire Agency must ensure that all participating personnel are trained and aware of their responsibilities within the operational management structure, including:
 - i. the chain of command relevant to their position and duties; and
 - ii. the full extent and limits of their rights and responsibilities.

B.4.2. Aircraft Dispatch

(Note: “Dispatch” in this section refers to the complete process of mobilising an aircraft to undertake a required task, which includes, but is not limited, to an Aircraft Operator’s internal flight dispatching function and the Fire Agency’s procedures for activating an aircraft to undertake a task.)

- a. Prior to any aircraft mobilisation the technical requirements of the Aircraft Operator’s internal dispatch system must be satisfied (e.g. ensuring airworthiness of the aircraft, qualifications and experience of the Flight Crew etc).

- b. Systems must be in place to ensure that, when requesting aircraft for operational use, the Fire Agency can be satisfied that:
 - i. the duties that must be performed have been properly assessed and that the aircraft that can best meet those requirements has been identified; and
 - ii. all requested aircraft are provided by Aircraft Operators that meet the requirements of the Fire Agency (including any Aircraft Operator approval system that may be in place); and
 - iii. all aircraft and associated equipment meet the requirements of the Fire Agency (including any approval system that may be in place).
- c. Dispatch systems should be designed to minimise any unnecessary delay in the mobilisation of the aircraft. Consideration should be given to establishing systems where:
 - i. contractual or other arrangements with the Aircraft Operator ensure that response times are minimised (provided safety is not compromised);
 - ii. the readiness of aircraft is routinely reported to centres responsible for arranging dispatch;
 - iii. requests for aviation resources (e.g. from an on-site incident commander) are conveyed efficiently to the person or centre responsible for dispatch and include all necessary information for dispatch;
 - iv. there is ready access to the personnel who are required to approve dispatch, or there is a system of pre-determined dispatch approvals, applicable to defined circumstances.
- d. Dispatch systems should include a quality-controlled process to ensure, where appropriate, that support resources required (e.g. mobile fuel, suppressant and retardant concentrates) are also dispatched to a suitable location at an appropriate time.
- e. Dispatch systems should include a quality-controlled process to ensure, where appropriate, that personnel required to manage, supervise and support the operation of the aircraft at the tasks are also dispatched to suitable locations at appropriate times.
- f. Dispatch systems should ensure, where appropriate, that a contractual arrangement has been reached that specifies clearly:
 - i. the resources to be provided with the aircraft, including numbers of flight crew and ground-crew and any ancillary equipment; and
 - ii. the period of time for which the aircraft will be engaged and agreements for if and when extensions or limitations of the initial period are required.

B.4.3. Flight Notification and Flight Following

- a. The Fire Agency must have in place systems and processes to ensure that the details of any flight carried out on behalf of the Fire Agency is notified to the Fire Agency before or as the flight commences (Flight Notification). A Flight Notification should include, at a minimum:
 - i. aircraft details; and
 - ii. pilot, flight crew and passenger details; and
 - iii. flight details, including flight plan, intended operations, contact details and destination; and
 - iv. time of take-off and estimated arrival at destination.
- b. The manifest of flight crew and passenger names must be accessible to appropriate ground support personnel at all times while the aircraft is operating.
- c. If not otherwise provided by another agency (e.g. by an Air Traffic Control agency) or by the Aircraft Operator then the Fire Agency must have in place systems and processes that require monitoring (Flight Following) of the progress and safety of any flight carried out on behalf of the Fire Agency, by either procedural or automatic (electronic) means or both.
- d. Where procedural means is employed for Flight Following (generally referred to as a “Manual Flight Following System”) the procedure should require the aircraft to contact a designated responsible person on the ground at least every 30 minutes during the flight, or whenever there is a significant change in the flight plan.
- e. Where automatic means is employed for Flight Following, the specification should require that the system should automatically transmit the position of the aircraft:
 - i. at intervals no greater than every ten minutes for transit flights;
 - ii. at intervals no greater than every three minutes for tactical flights;and that positions are transmitted within one minute of acquisition.
- f. Where the Aircraft Operator has in place Flight Following systems that meet the reporting standards listed above, the Fire Agency may delegate Flight Following responsibility to the Aircraft Operator, provided that Flight Following information is available from the Aircraft Operator without delay if required.
- g. Where positive Air Traffic Control is provided by the relevant authority, the Fire Agency may elect to suspend the requirement for Flight Following.

B.4.4. Airspace Management

- a. In order to minimise the risk of mid-air collisions and to ensure efficiency in the area of operations, the Fire Agency must, in cooperation with Aircraft

Operators and, where relevant, airspace authorities (e.g Air Traffic Control) establish appropriate airspace management procedures.

- b. Airspace management procedures should ensure that, at a minimum:
 - i. all pilots have been made aware of other known aircraft in the area, including their type, location and mission, callsigns and contact details;
 - ii. all aircraft operating in the area are required to carry appropriate communications equipment;
 - iii. all pilots operating in the same area are instructed to maintain communications between aircraft;
 - iv. there is a default procedure in place that requires, whenever no other airspace management procedure has been put in place, pilots to communicate and organise safe circuit patterns, altitude levels, approach and departure directions and separation requirements;
 - v. where appropriate, the tactical portion of flights (e.g when operating in the vicinity of the fire incident) are conducted under visual meteorological conditions (even if flying under instrument flight rules);
 - vi. clear operational guidelines (e.g. block altitudes, circuit directions etc.) considering the aircraft type, operations being performed and local factors such as fire behaviour and terrain, are established and communicated to the relevant pilots prior to arrival at the incident site;
 - vii. guidelines are in place to ensure that any aircraft not immediately participating in low altitude operations (e.g. Firebombing, Rappel, Hover-exit) remain above a specified level or outside a specified area.

B.4.5. Fatigue Management

- a. Procedures must be in place to minimise risks associated with fatigue of Flight Crews, Fire Agency supervisors and ground support personnel.
- b. Procedures should include duty time limitations specifying the maximum allowable duty for flight crew and other personnel operating in positions where safety may be compromised by fatigue.
- c. Limitations on flying hours (for Flight Crew), on-call hours and rest hours should be considered and must be defined to take into account:
 - i. the type of duty being performed;
 - ii. effects of environmental conditions (e.g. high temperatures);
 - iii. the effects of both acute and accumulated fatigue;
 - iv. the effect of stressful conditions on fatigue;
 - v. quality of rest facilities.

- d. All periods of duty performed by any of the Flight Crew must be monitored and recorded by the Aircraft Operator and provided upon request to the Fire Agency.
- e. Procedures should encourage all relevant personnel to monitor their own levels of fatigue irrespective of specified limitations and to take responsibility for:
 - i. alerting supervisors to fatigue;
 - ii. not proceeding with missions if they are concerned that their state of fatigue will pose undue or unnecessary safety risks.
- f. If the ability of a person to perform their duties safely may be impaired by the effects of fatigue they must be relieved of their duties at the soonest possible opportunity. This decision should be made by their supervisor, who may be alerted to the situation by any Flight Crew or non-flight crew member.

B.4.6. Impairment Management

- a. Procedures must be in place to minimise risks associated with impairment by alcohol or drugs of Flight Crews, Fire Agency supervisors and ground support personnel.
- b. Procedures must ensure all personnel operating in positions where safety may be compromised are not impaired by alcohol or drugs.
- c. Procedures must ensure that no personnel impaired by alcohol or drugs are permitted aboard an aircraft performing fire-related operations. The Aircraft Operator may monitor this through regular or campaign testing or other means.
- g. Procedures should encourage all relevant personnel to monitor their own levels of impairment and to take responsibility for:
 - i. alerting supervisors to impairment;
 - ii. not proceeding with missions if impaired by the effects of alcohol or drugs.
- h. If the ability of a person role to perform their duties in a safety-sensitive role may be impaired by the effects of alcohol or drugs they must be relieved of their duties immediately. This decision should be made by their supervisor, who may be alerted to the situation by any Flight Crew or non-flight crew member.
- d. The relevant supervisor may preclude any personnel from operations if their performance is in question due to impairment.
- e. If any flight or ground staff is taking prescription medication that may affect their performance it is their responsibility to inform the relevant supervisor of their reduced ability or inability to participate in operations.

B.4.7. Communications

- a. Good quality air-to-air and air-to-ground communication is critical to safe and successful fire aviation. Systems and procedures must be in place to ensure reliable, quality communications to support aircraft operations.
- b. The Fire Agency should have in place a default communications plan for all operations, which describes standard means of communications for aircraft operating in fire areas where no other communications plan or procedure has been established (e.g. at the initial stages of an fire incident).
- c. The Incident Management Organization should include a dedicated communications planning position or communications officer. This position should implement a communications plan appropriate to the incident and liaise, where required, with other relevant agencies, including the applicable Civil Aviation Authority, Military Aviation Authority or air traffic control authority.
- d. Communications planning should take into account the use of all communication systems that can potentially be used in Fire Aviation, Aircraft may be equipped with, for example:
 - i. VHF-AM (normal civil aircraft communication means);
 - ii. UHF-AM or UHF-FM (normal military communication means);
 - iii. various AM and FM bands used by Fire Agencies for tactical communications;
 - iv. various AM and FM "Citizens Band" frequencies;
 - v. HF;
 - vi. Cellular phone;
 - vii. Satellite phones and Satcoms
 - viii. Data communications systems such as ARINC or other agency-specific systems;
 - ix. Paging systems.

Aircraft

- e. Only aircraft equipped to meet the requirements of the applicable communications plan should be permitted to operate in the area of a fire incident.
- f. All aircraft should be equipped with a reliable wide-coverage backup means of communication for use in the event of failure of the primary means (e.g. a satellite telephone which can be used should VHF or UHF communication fail).

Operational radio frequencies

- g. A combination of default fixed and mission-specific frequencies may be used for communication in the event of fire operations. Fixed frequencies must be organised in conjunction with the relevant Civil Aviation Authority and confirmed prior to each fire season. Other frequencies may be made available for the exclusive use of fire agencies in the event of fire operations.
- h. All frequencies to be used on a specific mission must be covered comprehensively during the pre-flight briefing and made easily available to flight crew and air base personnel for the duration of the flight.
- i. If the operational frequencies are reallocated or are to change for any reason, such as moving between geographical areas, this must be communicated in advance and clearly understood by both Air Crew and ground personnel.

Sterile Cockpit

- j. In order to maintain integrity of communications, especially for separation of aircraft, it is recommended that sterile cockpit procedures be adopted at all times within five nautical miles of any operational airport or landing site, and as far as practicable, when operating in a fire area.
- k. To complement sterile cockpit procedures, bases, dispatch offices or other personnel should not initiate radio communication which is not directly related to safe flight of the aircraft while an aircraft is in the vicinity of an airport or landing site or other high traffic area, until after landing is completed and the landing area cleared.

B.4.8. Operational Risk Management

- a. The Fire Agency and Aircraft Operator should collaborate to ensure that there is a robust system in place to identify and mitigate operational risks during all Fire Aviation operations.

B.4.9. Dynamic Risk Management

- a. The Fire Agency and Aircraft Operator should collaborate to ensure that all personnel, including Flight Crew, who may operate in positions that affect the safety of Fire Operations, are trained in the principles and procedures of dynamic risk management, where risks are assessed and re-assessed according to changes in conditions or circumstances at the time.

B.5. Fire aviation operations – general

B.5.1. Planning

Operational Planning

- a. Personnel planning fire aviation operations on behalf of the Fire Agency must:
 - i. ensure the appropriate approvals for operations have been obtained from the authorised officer representing the Fire Agency controlling the incident;

- ii. ensure that clear operational objective(s) are specified;
- iii. ensure that all personnel involved understand their roles;
- iv. obtain aircraft according to the existing agency procurement regulations;
- v. ensure that sufficient authorised and qualified personnel are available to perform required supervision and support roles;
- vi. consider potential operational contingencies (e.g. unsuitable weather) and develop strategies to respond to contingencies where required;
- vii. consider potential organisational and resourcing problems and develop strategies to mitigate these;
- viii. consider the effectiveness of the available aircraft for successfully completing the task;
- ix. ensure that all communications and flight following requirements are met;
- x. ensure that all airspace management requirements are able to be met.

Mission Planning

- b. At the stage of planning a specific mission, the responsible personnel must:
 - i. ensure that any flights required to complete the mission are approved by the appropriate authorised person;
 - ii. ensure that the task objectives and required outcomes are clearly specified;
 - iii. ensure that only authorised and qualified personnel conduct operational aviation roles;
 - iv. determine routes and areas of operation considering identified hazards and weather conditions;
 - v. discuss proposed flights and flight requirements with the respective pilot or suitably qualified person;
 - vi. ensure a communications plan and flight following plan in accordance with the recommended practices (see also B.4.7);
 - vii. ensure that all agency and operator personnel, including the flight crew, are briefed on the mission objectives and conduct of operations;
 - viii. conduct an operational briefing of the pilots and relevant agency personnel to ensure all are briefed on the agreed airspace management and communications requirements;
 - ix. ensure minimum PPE requirements are met (see B.5.3); and
 - x. ensure that specialist training and PPE requirements are met for operations with specific demands (i.e. flights over water); and

- xi. ensure all relevant personnel receive an appropriate aircraft safety briefing including any operation-specific considerations.

B.5.2. Briefings

- a. Quality, comprehensive briefings of personnel are critical to safe and successful fire aviation. Systems and procedures must be in place to ensure quality briefings during Fire Aviation operations. Incident Management Organisations must specify clear responsibilities for the conduct of briefings.
- b. In order to be effective, briefings must be appropriately tailored to the circumstances, considering factors such as:
 - i. role and responsibilities of the personnel being briefed;
 - ii. whether the information has been previously provided.
- c. In general terms briefings should aim principally to include only important or changed information, in order to avoid information overload or distraction. Other information may be provided in written form for reference if required.
- d. Briefings should be conducted, if practicable, where distractions are minimal.
- e. Consideration should be given to appropriate use of visual or electronic aids when conducting briefings. Written briefings may be utilised where appropriate.

B.5.3. Personal Protective Equipment (PPE)

- a. Procedures must be in place to ensure that appropriate Personal Protective Equipment is utilised by personnel involved in Fire Aviation.
- b. PPE Procedures should specify:
 - i. roles and/or specific personnel required to utilise PPE or specific operations requiring use of PPE; and
 - ii. PPE required to be utilised in each case.

B.6. Fire aviation operations – specific activities

B.6.1. Low Level Flight Operations

- a. Flight operations at low level (generally below 150m or 500' above ground level) require close attention to the management of the additional risks involved.
- b. Procedures must be in place to ensure:
 - i. relevant approvals that may be required by the Civil Aviation Authority, Military aviation authority are obtained;

- ii. the Aircraft operator has established procedures and standards for low level flight operations and these are properly documented and included in the relevant operations manuals;
- iii. required notifications of planned low level activity are provided to relevant authorities;
- iv. relevant ground firefighters are notified of planned low level operations;
- v. pilots have the required qualifications and competence for low level flying;
- c. Before any low level flight operations are undertaken, relevant hazards (such as electricity infrastructure, radio antennas and other obstructions) are identified;
- d. Personal Protective Equipment appropriate to low level operations (including head protection) is utilised by Flight Crew and passengers;
- e. Consideration should be given to equipping aircraft with, as appropriate to the operation:
 - i. flight crew and passenger crash protection, e.g.
 - 1. multi-point seatbelts providing upper-torso restraint,
 - 2. airbags;
 - ii. Wire Strike Protection Systems;
 - iii. hazard warning systems (e.g. power line detectors).

B.6.2. Doors Open or Removed Operations

- a. All operational flights carrying personnel should be conducted with doors attached and securely closed except where the doors must be open or removed to complete the flight objectives, e.g. in the case of:
 - i. helicopter hover exit, rappel and winch operations;
 - ii. parachute operations;
 - iii. aerial photography /filming operations;
 - iv. dropping of equipment or stores;
 - v. dropping of incendiaries.
- b. Procedures must be in place to ensure:
 - i. relevant approvals that may be required by the Civil Aviation Authority or Military aviation authority are obtained;

- ii. the Aircraft Operator has established procedures and standards for flight with doors open or removed and these are properly documented and included in the relevant operations manuals and aircraft flight manuals;
- iii. comprehensive briefing of all personnel involved in the operation.
- c. All operations conducted with doors open or removed should be done so:
 - i. in accordance with the Aircraft Operator's procedures and standards and the aircraft flight manual;
 - ii. with the minimum number of doors removed as necessary;
 - iii. with all loose items removed from the cabin or properly secured ;
 - iv. unused seatbelts and buckles secured firmly;
 - v. only if positive communication between pilot and on-board personnel can be maintained at all times throughout the flight.

B.6.3. Outlandings

- a. In these guidelines "outlandings" refer to the planned landing of an aircraft at a site that is not otherwise prepared as an aerodrome or helicopter landing site including, for example, but not limited to:
 - i. landing an aircraft on a road or in a field;
 - ii. landing a helicopter in field or clearing.
- b. Outlandings pose higher risks than landing on prepared sites and should only be attempted where necessary to achieve the objectives of the mission.
- c. Procedures must be in place to ensure:
 - i. relevant approvals are obtained;
 - ii. the site is suitable for landing the aircraft;
 - iii. the Aircraft Operator has established procedures and standards for outlandings and that these are properly documented and included in the relevant operations manuals and aircraft flight manuals.
- d. Consideration should be given to:
 - i. ensuring that the aircraft can safely depart the site once it has landed. This may extend to ensuring the availability of any specialised support equipment necessary to ensure departure (such as stairs, ground power units etc)
 - ii. avoiding outlandings in ecologically or environmentally sensitive areas.

B.6.4. Firebombing

- a. Firebombing involves the dropping or spraying from an aircraft of fire suppressant or retardant on to a fire, or into the expected path of a fire, in order to assist with controlling or managing the fire.
- b. There are many variables in firebombing. For example, firebombing may be conducted:
 - i. from fixed-wing aircraft or helicopters;
 - ii. with a variety of different suppressants and retardants;
 - iii. using self-filling or ground-filling aircraft (both fixed and rotary-wing);
 - iv. using a wide range of dispensing systems;
 - v. for a variety of fire control purposes (e.g. direct suppression, crew support, property protection) and using a variety of tactics (eg direct attack, parallel attack, indirect attack).
- c. Firebombing normally involves a higher level of potential hazards than many other aerial operations.
- d. To ensure the safety of Aircrew and persons on the ground, firebombing operations require a high level of diligence and very close attention to the management of the risks involved.
- e. Procedures must be in place to ensure:
 - i. relevant approvals that may be required by the Civil Aviation Authority or Military aviation authority for firebombing are obtained;
 - ii. relevant approvals are obtained from the owner or authority controlling the land on which fire suppressants or retardants are dispensed;
 - iii. the Aircraft Operator has established procedures and standards for firebombing and these are properly documented and included in the relevant operations manuals;
 - iv. required notifications of planned firebombing activity are provided to relevant authorities;
 - v. relevant ground firefighters are notified of planned firebombing operations;
 - vi. pilots have the required qualifications and competence to conduct firebombing operations;
- f. The Fire Agency must have in place systems and procedures to ensure:
 - i. all firebombing operations are properly supervised and aircraft are directed to the appropriate targets;
 - ii. firebombing operations are properly planned and are co-ordinated with ground operations;

- iii. firebombing operations are conducted in a manner that avoids unnecessary and inappropriate risks to the environment;
- iv. firebombing operations are ceased when:
 - A. the operation is not effective (e.g due to fire behaviour);
 - B. the firebombing objective has been achieved;
 - C. there is an unacceptable risk to the environment;
 - D. flying conditions are considered unsafe.
- g. The Fire Agency must have in place procedures to ensure clear unambiguous communications between firebombing aircraft, supervisors and ground personnel regarding firebombing operations. These procedures should include standard firebombing terminology, phraseology and definitions.
- h. Where self-filling firebombing aircraft are utilised (either fixed-wing or helicopter):
 - i. personal locator beacons suitable for use in water must be carried on the aircraft in a readily accessible position;
 - ii. the aircraft must be equipped with readily accessible, appropriate personal floatation devices;
 - iii. all persons on board the aircraft should wear appropriate personal flotation devices;
 - iv. all persons on board must be appropriately trained in escape from submerged aircraft.

Refer also to the procedures for low-level flight

B.6.5. Over water operations

[Drafting not yet completed]

[Drafting note – this section is intended to cover general over water operations – (ie is not intended to include scooping, hover filling or sea-snorkel-filling etc – these activities would be covered under firebombing)]

B.6.6. Aerial reconnaissance and intelligence gathering

[Drafting not yet completed]

B.6.7. Air Attack Supervision

[Drafting not yet completed]

[Drafting note – this section is intended to cover the operation of aircraft carrying out a supervision role – ie the aircraft carrying the Air Attack Supervisor/Air Tactical Group Supervisor, and including Lead-plane operations where applicable. It is not intended to cover the role of the supervisor themselves.]

B.6.8. Aerial ignition

[Drafting not yet completed]

[Drafting note – this section is intended to cover the aerial ignition of fires for backburning or burning out using:

- incendiary dispensing devices*
- underslung driptorches*
- hand incendiary launchers*

B.6.9. Rappelling and Hover Exit / Hover Jump

[Drafting not yet completed -]

B.6.10. Winching

[Drafting not yet completed -]

B.6.11. Filming operations

[Drafting not yet completed -]

B.6.12. Aerial Transport of Dangerous Goods

[Drafting not yet completed]

B.6.13. Night operations

[Drafting not yet completed]

B.6.14. Uncrewed aircraft system operations

[Drafting not yet completed]

[Drafting note – this section is intended to cover the operation of UAVs/UASs and Remotely Piloted Aircraft (RPAs) This is becoming a complex areas and may require several Practice Guides]

B.7. Aviation Ground Support Operations

B.7.1. Airbases

[Drafting not yet completed,]

[Drafting note – this section is intended to cover standards for airbases – including temporary bases -,and including runway and landing areas standards, equipment, recommended layout, security etc]

B.7.2. Airbase management

[Drafting not yet completed]

B.7.3. Handling and preparing retardants and suppressants

[Drafting not yet completed]

B.7.4. Aircraft refuelling

[Drafting not yet completed,]

[Drafting note – this section is intended to cover all aircraft refuelling operations including “hot” refuelling where appropriate]

B.7.5. Fuel transport vehicles

[Drafting not yet completed]

[Drafting note – this section is intended to cover standards for vehicles used to transport aviation fuel]

B.8. Aircraft Accidents and Incidents

B.8.1. Aircraft crashes, accidents and incidents

[Drafting not yet completed]

B.8.2. Search and Rescue Initiation

[Drafting not yet completed]

[Drafting note – this section is intended to cover procedures for initiating SAR action when an aircraft is missing or overdue]

B.8.3. Investigation and reporting

[Drafting not yet completed – currently in rough draft]

[Drafting note – this section is intended to cover procedures for investigating aircraft accidents and incidents – and reporting the outcomes of investigations. It will make reference to any standards agreed by IFAWG for reporting]

B.9. General Risk Management

B.9.1. Dynamic risk management

[Drafting not yet completed — mainly refers back to earlier references to dynamic risk management and the relevant Practice Guide]

B.9.2. Aircrew training and competency

[Drafting not yet completed]

[Drafting note – it is intended that this section will primarily refer to a Practice Guide that in turn sets out competency based requirements for Aircrew involved in fire aviation – or at least in key activities such as firebombing. It may need to cover:

- specific competencies that are required for the specific roles;*
- minimum experience requirements?*
- currency requirements for renewal; and*
- physical or mental fitness requirements?*

B.9.3. Crew Resource Management and Team Resource Management

[Drafting not yet completed]

[Drafting note – this section is intended to guide aircraft operators and fire agencies towards implementing CRM and TRM, including training in Human Factors and Threat and Error Management. (TRM is an extension of CRM involving all people in the team – including those on the ground)]

B.9.4. Aircraft operator auditing and quality control

[Drafting not yet completed]

[Drafting note – this section is intended to guide Fire Agencies in auditing Aircraft Operators. where relevant, to ensure that required standards are met and ensuring an appropriate level of quality.]

B.9.5. Performance measurement / measures

[Drafting not yet completed]

[Drafting note – this section is intended to guide Fire Agencies in developing performance measures for fire aviation operations, with a view to analysing performance and implementing measures to improve.]

C. COOPERATIVE ARRANGEMENTS

C.1. Background and Context

Sharing of aviation resources between jurisdictions provides the potential to generate considerable economic benefits and to improve effectiveness and efficiency of wildfire prevention and response.

There have been many instances of effective international collaboration in fire aviation. However there have also been examples of sharing of aircraft resources that have been ineffective, inappropriate and even unsafe. Sharing of aircraft across borders is likely to be an increasing feature of wildfire management and there are excellent opportunities to significantly enhance inter-jurisdictional resource sharing. It is in the best interests of all countries to utilise relatively expensive and specialised resources in the most efficient and effective manner. Outcomes from sharing of resources can be improved by establishing common operating procedures and standards and by embedding robust resource exchange procedures into pre-planned inter-jurisdictional agreements.

Cooperative arrangements between jurisdictions need not be limited to sharing of actual aircraft resources. For example, considerable benefits can be achieved through exchange of information, through cooperative research and development programs or cooperative procurement programs. In particular, the exchange of safety related information, such as the results of accident or near-miss investigations, is very valuable (refer to Section C4 below).

Arrangements for sharing of information or for other cooperative support programs may be specific to fire aviation or part of a wider cooperative mechanism. Incorporating suitable arrangements for fire aviation into broader programs will help with ensuring that aviation-related activities are appropriately integrated with other fire management activities.

C.1.1. General cooperative mechanisms

- a. Jurisdictions that utilise or may utilise fire aviation capabilities should consider developing and participating in formal cooperation arrangements covering, for example:
 - i. information exchange regarding, for example:
 - A. operational experience and learnings;
 - B. aircraft capabilities and performance;
 - C. standards;
 - D. operating procedures;
 - E. Aircraft Operator performance;
 - ii. exchange of personnel, including in capability planning and development phases;
 - iii. joint evaluation, research and development programs;
 - iv. joint purchasing and procurement of services or materials;

- v. provision of support and ancillary systems;
 - vi. deployment of aircraft resources (refer to Section C2 below);
 - vii. exchange of safety related information (refer to Section C4 below).
- b. Jurisdictions contemplating developing or upgrading cooperative mechanisms for fire aviation should consider integrating these with broader cooperative mechanisms that are established or are in the process of being established.

C.2. International Deployment

C.2.1. General approaches to resource sharing

There are three main ways to consider the possibilities for sharing of resources between nations:

- a. “Mainstream” sharing, whereby transboundary cooperation and transfer for resources is a regular component of normal wildfire preparedness and response, not just in times of emergency and disaster.

Aircraft are a firefighting resource that is generally well-suited to mainstream inter-jurisdictional sharing. Mainstream sharing provides the opportunity to spread the comparatively high costs of acquisition and maintenance of specialist aircraft and support systems, and aircraft can normally be relatively easily moved between countries.

Mainstream sharing can potentially extend to the situation where one country decides, after due investigation and consideration, to not establish a fire aviation capability at all, or to establish only limited capacity. Instead that country would rely, by agreement, on a neighbouring country to provide the appropriate capability.

- b. Border operations, whereby neighbouring countries agree on protocols to effectively treat a defined geographical area, normally covering either side of a border, as a joint responsibility. Such areas are commonly referred to as mutual response zones. Normally cross-border operations would allow aircraft from either side of a border to seamlessly respond to situations on the side of the border and within the defined zone according to the agreed protocols.
- c. Emergency operations, whereby a host country has exceeded or is likely to exceed its capacity to deal with an emergency or disaster situation and requests assistance from other nations.

Irrespective of the category, it has been well demonstrated that effective sharing of resources requires rigorous pre-planning by both host nations and sending nations. The most effective sharing of aviation resources has been achieved where comprehensive pre-planned arrangements are incorporated into bi-lateral or multi-lateral agreements.

Jurisdictions that utilise or may utilise fire aviation capabilities should therefore consider developing plans and agreements for both:

- i. deployment of aircraft and support resources to other jurisdictions; and
- ii. hosting aircraft and support resources from other jurisdictions.

C.2.2. Focus areas

Previous experiences of resource sharing provide guidance for areas on which to focus efforts to achieve improvement. These include, for example:

- a. Ensuring clarity in requests for resources. Requests must clearly define the outcomes required in order to enable a proper assessment of the most appropriate type of aircraft to best meet the objectives;
- b. Provision by the host of competent liaison and supervision for the aerial resources;
- c. Provision by the host of support and ancillary systems such as communications, flight following, and refuelling;
- d. Ensuring effective integration of the aerial resources with other fire management activities, in particular with ground based firefighting;
- e. Ensuring the aerial resources are used in a timely manner – and therefore making the most of the advantages offered by aerial resources; and
- f. Developing comprehensive pre-planned operating procedures, embedded in pre-arranged bi-lateral or multi-lateral agreements that cover, for example:
 - i. languages to be used;
 - ii. standards (for example by reference to the Fire Aviation Guidelines);
 - iii. operating procedures and support systems;
 - iv. terminology;
 - v. incident management systems;
 - vi. interoperability of equipment, especially communications equipment;
 - vii. preparedness and readiness requirements;
 - viii. agreement activation and resource deployment procedures.

C.3. International Agreements

- a. Where jurisdictions are developing or reviewing bi-lateral or multi-lateral agreements for sharing resources it is recommended that consideration be given to the subject areas and general format outlined in Practice Guides 7.1 and 7.2.
- b. Where practicable, it is recommended that agreements take the form of:

- i. an over-arching agreement; plus
 - ii. an annual operating plan.
- c. It is recommended that over-arching agreements should be fully reviewed and updated at least every five years.
- d. It is recommended that annual operating plans be fully reviewed and updated at least annually.
- e. Where appropriate, consideration should be given to incorporating specific aspects regarding fire aviation into broader bi-lateral and multi-lateral resource-sharing agreements rather than necessarily developing specific agreements for aviation resources. This is to help ensure that deployment of aviation resources is properly integrated with other related fire management or emergency management activities.

C.4. International exchange of safety related information

[Drafting not yet completed]

[Drafting note – this section is intended primarily to establish processes for the standardised exchange of information regarding accidents and incidents in fire aviation and other relevant sectors. This information will in turn support the ongoing maintenance of a database that will enable “lessons learnt” and further analysis, recognition of trends etc.

Basic data standards suggested as a starting point for a Fire Aviation incident/accident database are provided below in brown text as an indication of part of the possible content of this section.]

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Standard accident/incident data

DRAFT This DRAFT proposes standard minimum data that it is recommended be collected for all aircraft accidents and incidents involving fire aircraft.

1. This document also proposes standard formats for the data, to allow for the data to be incorporated into a common database which can be searched and used to identify patterns, common themes and common factors etc.
2. Once the standard data is agreed it is proposed to develop a Practice Guide which will provide guidance on investigation procedures and data collection.
3. The standard data proposed in the Table below is suggested as the minimum that should be acquired and recorded for any occurrence, principally to enable data to be compared between incidents, and patterns etc to be identified. Any accident investigation would normally be expected to obtain more comprehensive data and additional information.

4. Proposed standard data:

Key	Field	Data	Format		Notes
1	Date of occurrence	Local time at occurrence location	Enter <i>dd-Mon-year</i>		
2	Time of occurrence	Local time at occurrence location	Enter <i>hrs:min</i> <i>24hr clock</i>		
3	Aircraft category 1	Aircraft type category (eg Fixed Wing or Rotary Wing)	Select from list		
4	Aircraft category 2	Aircraft size category e.g. Type 1/Type 2/Type 3/ etc	Select from list		
5	Activity 1	Aircraft operation - 1 eg Firebombing/Aerial Ignition Non-fire etc	Select from list		Activity aircraft was engaged in a time of occurrence
6	Activity 2	Aircraft operation – 2 Actual operations training/currency flight for those operations	Select from two options		
7	Activity 3	Further detail of operations relevant to occurrence	Select from list		If non-fire selected above, include activity details here.
8	Phase	Phase of flight eg takeoff/landing/enroute/droppin g	Select from list		
9	Manufacturer	Aircraft Manufacturer	Free form or select from list		“Select from list” would avoid issues with different ways of referring to manufacturer
10	Model	Aircraft Model 1	Free form or select from list		
11	Model Designation	Aircraft Model 2	Free form or select from list		
12	Model name	Aircraft also known as	Free form		
13	Year	Aircraft year of manufacture (or rebuild)	Enter YYYY		
14	Registration	Aircraft Registration	Enter		In country of current registration
15	Serial Number	Aircraft Serial Number	Enter		Manufacturers serial number

16	Engine configuration	Number and type of engines	Select from list		
17	Engine Manufacturer	Engine Manufacturer	Select from list?		
18	Engine Model	Engine Model designations	Select from list?		
19	Aircraft Operator	Aircraft Operator	Enter – free form		Organisation operating aircraft at time of occurrence
20	Location 1	Occurrence location	Enter – free form		
21	Location 2	General region of occurrence	Enter – free form		e.g. region or province
22	State	Country of occurrence	Select from list		
23	Location	GEO location of occurrence	Enter – Lat-Long decimal		Details required to map occurrence
24	Damage	Damage to Aircraft	Select from list		
25	Persons On Board	Persons On Board	Enter number		
26	Fatalities total (air and ground)	Total Fatalities	Enter number		
27	Fatalities aircraft crew	Fatalities aircraft crew	Enter number		
28	Fatalities aircraft pax	Fatalities aircraft passengers	Enter number		
29	Fatalities ground	Fatalities on ground	Enter number		(not including aircraft crew or passengers)
30	Injuries aircraft crew	Serious injuries aircraft crew	Enter number		
31	Injuries aircraft pax	Serious injuries passengers	Enter number		
32	Description of occurrence	Brief narrative description of incident	Enter – free form		
33	Type of occurrence	Nature of incident	Select from list		
34	Cause 1	Causal factor 1	Enter – free form		
35	Cause 2	Causal factor 2	Enter – free form		

36	Recommendations	Recommendations	Enter – free form		
37	Additional information	Additional information	Enter – free form		
38	Sources	Sources of data	Enter – free form		
39	Further information	Source of any further information	Enter – free form		
40	Links	[hyperlinks to any source documents or additional references]	www.		
41	Photos or diagrams	[hyperlinks or references to any relevant photos or diagrams]	www.		
42	Follow-up	[field to note whether follow-up action is required by IFAWG]			
43	Follow-up-date	Date follow-up action is required to be completed	Enter <i>dd-Mon-year</i>		
45	Associated material	[Repository for actual documents, photos, articles etc associated with accident/incident]	Attachments etc		

D. PRACTICE GUIDES

Index to Practice Guides

[Drafting note – this is a list of planned Practice Guides. Not all are included at this stage]

Guide Number	Subject	
1.	Guides primarily for Fire Agencies	
1.1.	Agency dispatch decisions and systems	
1.2.	Auditing and quality control	
1.3.	Air operations performance measurement	
2.	Guides primarily for Aircraft Operators	
2.1.	Aircraft Operator management systems	
2.2.	Safety Management	
2.3.	Aircraft airworthiness and maintenance	
2.4.	Flight operations management	
2.5.	Aircraft dispatch (Aircraft Operator systems)	
2.6.	Aircraft security	
2.7.	Aircraft ground handling	
2.8.	Aircrew training and competency	
2.9.	Crew Resource Management	
3.	Aircraft Standards	
3.1.	Aircraft equipment	
4.	Air Operations Management	
4.1.	Air operations management structures – Incident Control System <i>New numbering system: AM 4.1</i>	

4.2.	Emergency response planning	
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International Fire Aviation Working Group

PRACTICE GUIDE AO 2.1

Aircraft Operator Management Systems

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding the organisational management systems that an Aircraft Operator should have in place in order to conduct aerial operations at fires.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe, efficient and effective operation of aircraft in fire management, the organisation operating the aircraft requires appropriate management systems, policies, programs, processes, and procedures.
- 1.2. In order to manage the risks associated with sharing of aircraft resources between States through bilateral or multilateral agreements, it is important that certain standards are in place for the operator of the aircraft. This Practice Guide sets out the minimum standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. Management Systems

- 2.1. The Aircraft Operator must have a management system that has continuity throughout the organisation and ensures control of operations and management of safety and security outcomes.
- 2.2. The Aircraft Operator must have designated senior officials within the management system that have the responsibility, and thus are accountable for ensuring, within all operational areas:
 - a. the allocation of resources necessary to manage safety risks and security threats to aircraft operations;
 - b. operations are conducted in accordance with conditions and restrictions of the Air Operator Certificate; and

- c. compliance with applicable procedures, policies, manuals and standards of the operator.
- 2.3. The Aircraft Operator must have a process for the delegation of duties within the management system that ensures managerial continuity is maintained when operational managers, including nominated post holders, if applicable, are absent from the workplace.
- 2.4. The Aircraft Operator must have a communication system that enables an exchange of information relevant to the conduct of operations throughout the management system and in all areas where operations are conducted.
- 2.5. The Aircraft Operator must ensure that management and non-management positions within the organisation which require the performance of functions relevant to the safety or security of aircraft operations are filled by personnel on the basis of knowledge, skills, training and experience appropriate for the position.
- 2.6. The Aircraft Operator must ensure that personnel who perform functions that affect the safety or security of aircraft operations are required to maintain competence on the basis of continued education and training and, if applicable for a specified position, continue to satisfy any mandatory technical competency requirements.
- 2.7. The Aircraft Operator must have in place a policy that requires personnel who perform operationally critical functions to be physically and medically fit for duty.
- 2.8. The Aircraft Operator must have in place a system for the management and control of documentation and/or data used directly in the conduct or support of operations, to include processes for:
- a. Identifying the version of operational documents;
 - b. Distribution that ensures availability of the current version of applicable operations, maintenance and security manuals:
 - i. in appropriate areas of the organisation;
 - ii. to external service providers that conduct outsourced operational functions.
 - c. review and revision as necessary to maintain the currency of information contained in documents;
 - d. document retention that permits easy reference and accessibility;
 - e. identification and control of obsolete and/or reproduced documents;
 - f. retention and dissemination of documents received from external sources, to include manuals and documents from regulatory authorities and original equipment manufacturers.
- 2.9. The Aircraft Operator must have in place a system for the management and control of operational records to ensure the content and retention of such records is in accordance with requirements of the relevant Fire Agency and the Civil Aviation Authority or equivalent military aviation authority, as applicable, and to ensure operational records are subjected to standardised processes.

- 2.10. The Aircraft Operator must have a quality assurance program that provides for the auditing and evaluation of the management system, and of operations and maintenance functions, to ensure the organisation is:
- a. complying with applicable legislation, regulations and directives of the Civil Aviation Authority or military aviation authority or Fire Agency as applicable;
 - b. complying with applicable procedures, policies, manuals and standards of the Aircraft Operator;
 - c. satisfying stated operational needs of the Fire Agency;
 - d. identifying areas requiring improvement;
 - e. identifying hazards and risks to operations.
- 2.11. The Aircraft Operator must have a process for addressing findings that result from audits conducted under the quality assurance program, which ensures the:
- a. identification of root cause(s);
 - b. development of corrective action as appropriate to address findings;
 - c. implementation of corrective action in appropriate operational area(s);
 - d. evaluation of corrective action to determine effectiveness.
- 2.12. The Aircraft Operator must have in place processes to ensure a contract or agreement is executed with external service providers that conduct outsourced operations, maintenance or security functions for the Aircraft Operator. The contract or agreement should identify measurable specifications that can be monitored by the Aircraft Operator to ensure requirements that affect the safety and/or security of operations are being fulfilled by the service provider.
- 2.13. The Aircraft Operator must ensure that, where an external service provider conducts outsourced operations for the Aircraft Operator that there are rigorous processes in place to:
- a. identify and resolve any incompatibility between organisational policies, operating procedures, manuals and Air Operators Certificate conditions and limitations.
 - b. brief service provider personnel on relevant policies, procedures and systems
 - c. continue to provide an exchange of information with the service provider's personnel relevant to the conduct of operations
 - d. Regularly audit and monitor the adequacy of the service provider's personnel check and training system, including the maintenance of qualification, experience and currency records.
 - e. Regularly audit and monitor the service provider's compliance with:
 - i. the service provision contract or agreement; and

ii. legislative and regulatory requirements.

- 2.14. The Aircraft Operator must have an adequate accounting system for the management and control of organisational finances including:
- a. the reconciliation of flight operations records (e.g. hours flown)
 - b. the production of accurate invoice.
- 2.15. The Aircraft Operator must have aircraft engineering and maintenance management systems in accordance with Practice Guide 2.3.

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Feedback to improve this guide is welcome

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International Fire Aviation Working Group

PRACTICE GUIDE AO2.2

Aircraft Operator Safety Management

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding the management of operational safety by Aircraft Operators who conduct aerial operations at fires.

Users of this guide should note carefully that additional guidance regarding operational safety may be included in other Practice Guides.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe operation of aircraft in fire management, the organisation operating the aircraft requires appropriate management systems, policies, programs, processes, and procedures.
- 1.2. In order to manage the risks associated with sharing of aircraft resources between States through bilateral or multilateral agreements, it is important that certain standards are in place for the operator of the aircraft. This Practice Guide sets out the minimum standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. Operational Safety

- 2.1. The Aircraft Operator must have a corporate safety policy that reflects the organisation's commitment to workplace safety and the safety of flight operations. The policy must include statements regarding:
 - a. the commitment of the organisation's management to safety;
 - b. the provision of the necessary resources for the implementation of the safety policy
- 2.2. The corporate safety policy must be communicated throughout the organisation.

- 2.3. The Aircraft Operator must have an organisational safety culture that establishes safety and the protection of human life as an overriding consideration in all activities.
- 2.4. The Aircraft Operator should have a safety management system (SMS) that is implemented and integrated throughout the organisation to address the safety of aircraft operations.
- 2.5. The Aircraft Operator must have an operational safety reporting system that is implemented throughout the organisation in a manner that:
- a. Encourages and facilitates feedback from personnel to report safety hazards, expose safety deficiencies and raise safety or security concerns;
 - b. Ensures mandatory reporting in accordance with applicable regulations;
 - c. Includes analysis and management action as necessary to address safety issues identified through the reporting system.
- 2.6. The Aircraft Operator should have implemented a safety risk assessment and mitigation program that specifies processes to ensure:
- a. hazards are analysed to determine the existing and potential safety risks to aircraft operations;
 - b. safety risks are assessed to determine the requirement for risk control action(s); and
 - c. when required, risk mitigation actions and controls are developed and implemented.
- 2.7. The Aircraft Operator must have a plan or a series of plans for the management and coordination of all activities should it be necessary to respond to a major aircraft accident or other operational event that results in fatalities, serious injuries or considerable damage.
- 2.8. The Aircraft Operator must ensure that emergency response plans are reviewed and rehearsed regularly.

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United Nations
International Strategy for Disaster Reduction

International Fire Aviation Working Group

PRACTICE GUIDE AO2.3

Aircraft Airworthiness and Maintenance

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding the requirements for maintaining the airworthiness of aircraft involved in fire aviation.

Application

- Aircraft Operators engaged in operating aircraft to support fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. An important control for certain identified risks in fire aviation is to ensure that aircraft are airworthy and properly maintained.
- 1.2. The organisation operating the aircraft and the organisation maintaining the aircraft must have appropriate systems and procedures to ensure proper airworthiness and maintenance of aircraft.
- 1.3. In order to manage the risks associated with sharing of aircraft resources between States through bilateral or multilateral agreements, it is important that certain standards are in place for the operator of the aircraft. This Practice Guide sets out the minimum standards relating to the management of airworthiness that are acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. Operation of Aircraft

- 2.1. The Aircraft Operator must ensure an aircraft is not operated unless it is maintained and released to service by a maintenance organisation that:
 - a. has established procedures acceptable to the relevant Civil Aviation Authority or equivalent military or government Authority ("the Authority") that ensure maintenance practices are in compliance with all relevant requirements; and

- b. where required, has the appropriate approval of the Authority or is otherwise acceptable to the Authority.
- 2.2. The Aircraft Operator must ensure that any aircraft is operated in accordance with a valid Certificate of Airworthiness issued by the relevant Authority.
- 2.3. The Aircraft Operator must ensure that any aircraft is operated in accordance with the conditions and limitations of the Certificate of Airworthiness.
- 2.4. The Aircraft Operator must ensure that any aircraft is operated in accordance with the conditions and limitations of Aircraft's Flight Manual.

3. Airworthiness and Maintenance Systems

- 3.1. The Aircraft Operator must have a Maintenance Organisation (MO) responsible for ensuring the airworthiness of the aircraft and for conducting continuing maintenance on the aircraft. The MO may be part of the Aircraft Operator's organisation ("in-house") or may be outsourced to an external service provider.
- 3.2. Irrespective of whether the MO is in-house or outsourced, the Aircraft Operator must have clearly identified the person in the Aircraft Operator's management structure with overall responsibility and accountability for airworthiness and aircraft maintenance. This function may not be outsourced.
- 3.3. Irrespective of whether the MO is in-house or outsourced the Aircraft Operator must have a quality assurance program that provides for the auditing of all functions of the management systems required to assure aircraft maintenance and airworthiness.
- 3.4. Where the MO is outsourced the Aircraft Operator must ensure that the MO complies with the Standards and Recommended Practices, as required.
- 3.5. The Aircraft Operator must ensure that an agreement has been executed with each external maintenance organisation that performs maintenance functions for the Operator; and such an agreement must:
 - a. specify all maintenance requirements and define all tasks to be performed;
 - b. require compliance with the procedures governing maintenance arrangements.
 - c. specify measurable maintenance safety and quality standards required to be fulfilled by the respective external maintenance organisation.
- 3.6. The Aircraft Operator must provide, for the use and guidance of both the MO and for the use and guidance of Aircraft Operator's personnel responsible for providing oversight of the MO, a Maintenance Program and maintenance data, approved by the relevant Authority, containing the required information for each aircraft type.
- 3.7. The Aircraft Operator must have a communication system that enables and ensures an effective exchange of information relevant to the conduct of maintenance operations with each MO that performs maintenance for the Operator.
- 3.8. The Aircraft Operator must have a system that ensures effective communication to the MO of non-scheduled maintenance requirements identified during aircraft operations.

- 3.9. The MO, whether in-house or outsourced, must have internal management systems that ensure:
- management of safety and quality in maintenance operations;
 - supervision and control of maintenance activities;
 - compliance with applicable manuals and standards of the Aircraft Operator.
 - compliance with the requirements of the relevant Civil or equivalent military Aviation Authority.
- 3.10. The MO must have an internal quality assurance program that provides for auditing of all functions of the management system for maintenance operations to ensure the MO is:
- complying with the applicable manuals and standards of the Aircraft Operator;
 - satisfying stated maintenance needs;
 - identifying undesirable conditions and areas requiring improvement; and
 - identifying hazards in maintenance operations.
- 3.11. The MO must maintain a Maintenance Management Manual (MMM) that includes:
- A comprehensive description of the scope, structure and functionality of the management system for maintenance operations;
 - A description of departments, positions, authorities, duties, responsibilities and the interrelation of functions and activities within the system; and
 - Policies and procedures for aircraft maintenance.
- 3.12. The MO must ensure the MMM is amended as necessary to keep information contained therein up-to-date and to address:
- changes to maintenance or airworthiness requirements;
 - changes in the organisation or activities;
 - inadequacies identified through internal or external audit;
 - conformity with applicable requirements.
- 3.13. The MO must have a staff of management personnel suitably matched to the scale and scope of maintenance operations to ensure:
- maintenance of all aircraft is performed in accordance with the relevant Maintenance Program; and
 - all maintenance is carried out in accordance with policies and procedures contained in the MMM.

- 3.14. The MO and any other maintenance organisation that performs maintenance for the Operator must have a manager that is acceptable to the relevant Civil or equivalent military Aviation Authority, if required, and is responsible, and thus accountable for ensuring the:
- a. management of safety risks in maintenance operations; and
 - b. maintenance operations are conducted in accordance with conditions and restrictions of Airworthiness Certifications, and in compliance with applicable manuals and standards of the Aircraft Operator.
- 3.15. The MO and any other maintenance organisation that performs maintenance for the Operator must have the necessary facilities, workspace, equipment and supporting services, including work environment, to ensure maintenance is performed in accordance with the Maintenance Program.
- 3.16. The MO must ensure that management and non-management positions within the organisation which require the performance of functions relevant to aircraft airworthiness are filled by personnel on the basis of knowledge, skills, training and experience appropriate for the position.
- 3.17. The MO must have a system for the management and control of documentation and technical data used directly in the conduct or support of maintenance operations, to include processes for:
- a. identifying the current version of maintenance documents;
 - b. ensuring the timely distribution and availability of the current version of applicable maintenance documentation and technical data to the appropriate personnel in all areas where maintenance is performed;
 - c. reviewing and revising the information contained in the MMM and other maintenance documents as necessary to maintain their currency;
 - d. retaining engineering and maintenance documents in a manner that permits easy reference and accessibility;
 - e. identification and control of obsolete and/or reproduced documents; and
 - f. retention and dissemination of documentation received from external sources, including manuals and documents from regulatory authorities and Original Equipment Manufacturers (OEM).
- 3.18. The MO must have an operational reporting system implemented in maintenance operations that:
- a. encourages and facilitates feedback from personnel to report safety hazards, expose safety deficiencies and raise safety concerns; and
 - b. includes analysis and management action as necessary to address safety issues identified through the reporting system.
- 3.19. The Aircraft Operator must have a system for forecasting and tracking required maintenance activities. This responsibility may be formally delegated to the MO.

- 3.20. The Aircraft Operator must have a system for tracking hours, cycles and calendar time for airframes, engines and life-limited components. This responsibility may be formally delegated to the MO.
- 3.21. The Aircraft Operator must have a maintenance control centre or equivalent organisation that is responsible for approving, controlling, monitoring and scheduling non-routine and deferred maintenance activities, including Minimum Equipment List (MEL) requirements. This responsibility may be formally delegated to the MO.
- 3.22. The Aircraft Operator and the MO must have processes to ensure:
- aircraft parts and materials are only obtained from approved sources;
 - requirements for certification documents are specified;
 - used or surplus parts are traceable; and
 - a statement of conformity or certification of test results is retained for hardware and raw materials (e.g. extrusions, sheet or bar stock);
- 3.23. The MO must have a process to ensure that no new part is installed on an aeronautical product unless the part meets the standards of airworthiness applicable to the installation of new parts and either:
- the new part has a marking identifying it as a part specified in the type design conforming to a recognised national or international standard, or
 - the part has been approved for use on an aeronautical product, in accordance with the type certificate/STC, if the part was originally designed and manufactured for non-aeronautical use, or
 - the new part was manufactured under a Parts Manufacturer Approval (PMA).
- 3.24. The MO must have a process to ensure that no used part is installed on an aeronautical product unless the part meets the standards of airworthiness applicable to the installation of used parts and is either:
- an airworthy part that has been removed from an aircraft for immediate installation on another aircraft, or
 - an airworthy part that has undergone maintenance for which a maintenance release has been signed by an appropriately rated Approved Maintenance Organisation (AMO).
- 3.25. The MO must have a process to ensure that no used life-limited part is installed on an aeronautical product unless the part meets the standards of airworthiness applicable to the installation of life-limited parts and:
- the technical history of the part is available to demonstrate the time in service, as authorised for that part in the type certificate governing the installation, has not been exceeded;
 - the technical history referred to in sub-paragraph a) is incorporated into the technical record for the aeronautical product on which the part is installed.

- 3.26. The Aircraft Operator must have a process to obtain and assess continuing airworthiness information, such as Airworthiness Directives (ADs), Alert Service Bulletins and recommendations from the organisations responsible for the type design, and must implement the resulting actions considered necessary, in accordance with a procedure acceptable to the Civil Aviation Authority or equivalent military authority, if required. This responsibility may be formally delegated to the MO.
- 3.27. The Aircraft Operator must maintain records of Airworthiness Directives (ADs) and Service Bulletins (SBs) or equivalents accomplished. This responsibility may be formally delegated to the MO.
- 3.28. The Aircraft Operator must have a process to ensure that any Aircraft Flight manual or other documentation required for the operation of the Aircraft is maintained and incorporates appropriate amendments as required from time to time.
- 3.29. The Aircraft Operator must have a process to ensure all modifications and repairs carried out comply with airworthiness requirements acceptable to the State of Registration or Civil Aviation Authority or equivalent military authority; and procedures are established to ensure that technical records supporting compliance with the airworthiness requirements are retained. This responsibility may be formally delegated to the MO.
- 3.30. The Aircraft Operator must have a process to track chronic or repetitively unserviceable items, document the troubleshooting history and implement instructions for corrective action. This responsibility may be formally delegated to the MO.
- 3.31. If the Aircraft Operator utilises aircraft with electronic navigation capabilities, the Aircraft Operator must have a procedure to ensure the timely insertion of current and unaltered electronic navigation data to all applicable aircraft.
- 3.32. The Aircraft Operator must have a program to ensure the following maintenance records are maintained:
- a. Total Time In Service (hours, calendar time and cycles, as appropriate,) of the aircraft, engines and all life-limited components;
 - b. current status of compliance with all mandatory continuing airworthiness information;
 - c. appropriate details of modifications and repairs;
 - d. time in service (hours, calendar time and cycles, as appropriate,) since last overhaul of the aircraft, engines or its components subject to a mandatory overhaul life;
 - e. current aircraft status of compliance with the Maintenance Program;
 - f. Detailed maintenance records to show that all requirements for signing of a maintenance release have been met.
- 3.33. The Aircraft Operator must have a procedure to ensure that records specified in 3.32 are retained as follows:

- a. records in sub-paragraphs a. to e. are retained for a minimum period of 180 days after the aircraft, engine and component, to which they refer, has been permanently withdrawn from service; and
 - b. records in sub-paragraph f. are retained for a minimum period of one year after the signing of the maintenance release.
- 3.34. The Aircraft Operator must have processes to ensure, when an aircraft becomes involved in an accident or incident, the related flight recorder records and, to the extent possible, the associated flight recorders are preserved and retained in safe custody pending disposition in accordance with the appropriate investigation.
- 3.35. The Aircraft Operator must have a process to ensure that an Aircraft Technical Log (ATL) or an approved equivalent is maintained for all aircraft operations.
- 3.36. The Aircraft Operator must have a process to ensure that the completed ATL pages are retained to provide a continuous record of the last six months of operations.
- 3.37. The Aircraft Operator must have a procedure to maintain fuel and oil records, and must ensure such records are made available to the appropriate part of the organisation for the purposes of:
- a. checking and amending, if required, aircraft performance and flight planning figures; and
 - b. identifying changes in consumption patterns that may warrant further investigation by the MO; and
 - c. accident investigation, if required.
- 3.38. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has nominated appropriate personnel with responsibilities for ensuring the maintenance organisation is compliant with the requirements for an approved maintenance organisation as accepted by the Authority.
- 3.39. The Aircraft Operator must ensure each approved maintenance organisation that performs maintenance for the Aircraft Operator has an independent quality assurance program that:
- a. monitors compliance with applicable regulations, requirements and the Maintenance Procedures Manual (MPM) of the AMO;
 - b. addresses the specific requirements of the Aircraft Operator, as specified in the maintenance agreement; and
 - c. is under the sole control of the Quality Manager or the person assigned managerial responsibility for the program.
- 3.40. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator utilises maintenance personnel whose competence has been established in accordance with a procedure and to a level acceptable to the authority granting approval for the maintenance organisation.

- 3.41. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator utilises appropriately licensed/authorised maintenance personnel to sign the Maintenance Release.
- 3.42. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has a training program that assures all maintenance personnel receive initial, continuation and any additional training appropriate to individual assigned tasks and responsibilities.
- 3.43. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has a training program that includes training in the knowledge and skills related to human performance, including coordination with other maintenance personnel and flight crew.
- 3.44. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has the basic facilities and work environment, appropriate for the maintenance tasks to be performed for the Operator.
- 3.45. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has the necessary technical data, equipment, tools and material to perform the work for which the maintenance organisation has been approved.
- 3.46. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has facilities suitable for the storage of parts, equipment, tools and material under conditions that provide security and prevent deterioration of and damage to stored items.
- 3.47. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has a shelf-life program for applicable stored items, which includes a requirement for the shelf-life limit to be controlled and displayed.
- 3.48. The Aircraft Operator must ensure each maintenance organisation that performs maintenance for the Aircraft Operator has a process for segregating aircraft serviceable parts, aircraft non-serviceable parts, and non-aircraft parts.

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PRACTICE GUIDE AO2.4

Aircraft Operator Flight Operations Management

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding the management of flight operations by Aircraft Operators who conduct aerial operations at fires.

Users of this guide should note carefully that additional relevant guidance regarding management of flight operations may be included in other Practice Guides.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe and effective operation of aircraft in fire management, the organisation operating the aircraft requires appropriate systems, policies and procedures for the management of flight operations.
- 1.2. In order to manage the risks associated with sharing of aircraft resources between States through bilateral or multilateral agreements, it is important that certain standards are in place for the operator of the aircraft. This Practice Guide sets out the minimum recommended standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. Certification

- 2.1. The Aircraft Operator must have a valid certificate or equivalent document issued by the state Civil or Military Aviation Authority (the Authority) that authorizes the operator to conduct aerial fire management operations in accordance with specific conditions or limitations.
- 2.2. The Aircraft operator must have systems and processes to ensure compliance with any specific limitations or conditions of the certification referred to above.

3. Flight Operations Management

- 3.1. The Aircraft Operator must assign responsibility for management and supervision of specific areas of operations management, including, as a minimum:
- a. fleet operations;
 - b. documentation and document control;
 - c. training;
 - d. scheduling;
 - e. accident prevention and flight safety;
 - f. quality management ;
 - g. security.
- 3.2. The Aircraft Operator must ensure delegation of authority within flight operations to ensure managerial continuity.
- 3.3. The Aircraft Operator must maintain a communication system that enables and ensures an effective exchange of information relevant to the conduct of flight operations throughout the flight operations management system and among operational personnel.
- 3.4. The Aircraft Operator must have a process to ensure the timely dissemination of safety-critical operational information to appropriate personnel within and external to the flight operations organization, to include:
- a. Airworthiness Directives (ADs);
 - b. manufacturer bulletins;
 - c. flight crew bulletins or directives;
 - d. Notice to Airmen (NOTAM)s.
- 3.5. The Aircraft Operator must have a process to ensure that any crew, prior to being utilised as flight crew members on fire operations, are confirmed to possess the requisite certifications, skills, competencies and other attributes required by the Aircraft Operator, the Authority and the Fire Agency.
- 3.6. The Aircraft Operator must have a process for confirming that candidates for the position of Pilot-in-Command (PIC) meet any prerequisite minimum levels of flight experience.
- 3.7. The Operator shall have published criteria for the selection, to include a minimum experience level in line operations that is acceptable to the Operator and/or the State.
- 3.8. The Aircraft Operator must have a process for confirming that candidates for positions of instructor, evaluator and check pilot meet prerequisite minimum levels of flight experience and other relevant criteria.

4. Operational Documentation

- 4.1. The Aircraft Operator must have a system for the management and control of flight operations documentation and/or data used directly in the conduct or support of operations.
- 4.2. The Aircraft Operator should ensure that documentation used in the conduct or support of flight operations:
 - a. contains legible and accurate information;
 - b. is written in language(s) understood by flight operations personnel;
 - c. is presented in a format that meets the needs of flight operations personnel;
 - d. if required, is accepted or approved by the Authority.
- 4.3. If the Aircraft Operator utilizes an electronic system for the management and control of any documentation and/or data used directly in the conduct of flight operations, the Aircraft Operator should ensure the system provides for a scheduled generation of back-up files for such documentation and/or data.
- 4.4. The Aircraft Operator must ensure documents that comprise the onboard library carried onboard the aircraft for each flight and located in a manner that provides for access by the flight crew.
- 4.5. The Aircraft Operator must maintain an Operations Manual (OM) for the use of personnel in the flight operations organization which contains the policies, procedures, checklists and other guidance or information necessary for compliance with applicable regulations, laws, rules and Aircraft Operator standards.
- 4.6. If required by the Authority, the Aircraft Operator shall have a process to ensure the Operations Manual (OM), to include amendments and/or revisions, is submitted to the Authority for acceptance or approval.
- 4.7. The Aircraft Operator must ensure information in the OM pertaining to flight crew duties and responsibilities is published in appropriate common language(s).
- 4.8. The OM should be designed such that the specific parts of the OM relevant to flight crew are clearly identified and defined;
- 4.9. The Aircraft Operator must have a process to develop and establish procedures and checklists for use by the flight crew. Such process shall ensure:
 - a. Human factors principles are observed in the design of checklists and associated procedures;
 - b. Any differences from procedures and checklists provided by the manufacturer(s) are based on operational considerations, and the justification for the difference is clearly recorded.

5. Operations records

- 5.1. The Aircraft Operator must require that designated personnel maintain appropriate records of flight operations.

- 5.2. The Aircraft Operator must have a system for the management and control of flight operations records to ensure the content and retention of such records is in accordance with requirements of the Authority, as applicable, and to ensure operational records are subjected to standardized processes for:
- a. identification of aircraft and flight crew;
 - b. legibility;
 - c. maintenance;
 - d. retention and retrieval;
 - e. protection and security;
 - f. disposal, deletion (electronic records) and archiving.

6. Operations quality assurance

- 6.1. The Aircraft Operator should have a quality assurance program that provides for the auditing and evaluation of the flight operations management system and operational functions at planned intervals to ensure the organization is:
- a. complying with applicable regulations and the standards of the Aircraft Operator;
 - b. satisfying stated operational needs;
 - c. satisfying the requirements of clients such as Fire Agencies;
 - d. Identifying undesirable conditions and areas requiring improvement.
- 6.2. The Aircraft Operator should have a process for addressing findings that result from audits of flight operations functions, which ensures:
- a. identification of root cause(s);
 - b. development of corrective action as appropriate to address the finding(s);
 - c. implementation of corrective action in appropriate operational areas;
 - d. evaluation of corrective action to determine effectiveness.

7. Safety Management in Flight Operations

(See also IMCR Practice Guide 2.3 Safety Management).

- 7.1. The Aircraft Operator must have a safety risk assessment and mitigation program implemented in the flight operations organization that specifies processes to ensure:
- a. hazards are analyzed to determine the existing and potential safety risks to aircraft operations;
 - b. safety risks are assessed to determine the requirement for risk control action(s);

- c. when required, risk mitigation actions are developed and implemented in flight operations.

7.2. The safety risk assessment and mitigation program should include an operational reporting system implemented in the flight operations organization that:

- a. encourages and facilitates feedback from flight operations personnel to report safety hazards, expose safety deficiencies and raise safety or security concerns;
- b. includes analysis and flight operations management action to address operational deficiencies, hazards, incidents and concerns identified through the reporting system.

7.3. The Aircraft Operator should have processes implemented in the flight operations organization that include a combination of reactive and proactive methods for safety data collection and analysis to ensure existing and potential hazards to aircraft operations are identified.

8. Training and checking

8.1. The Aircraft Operator must ensure that flight crew members, instructors, evaluators and check pilots, whether employed or subcontracted, are qualified for their assigned tasks.

8.2. The Aircraft Operator must maintain a training and evaluation program, approved or accepted by the Authority, that consists of ground and flight training and, when applicable, evaluations to ensure flight crew members are competent to perform assigned duties. The program shall ensure training is conducted for each type of aircraft in the fleet and, as a minimum, address:

- a. initial qualification;
- b. continuing qualification;
- c. re-qualification;
- d. aircraft transition or conversion;
- e. upgrade to PIC;
- f. as applicable, other specialized training requirements.

8.3. The Aircraft Operator must ensure that the training and evaluation program includes, where relevant to the operation, ancillary training and recurrent training for flight crew in, for example;

- a. escape from submerged aircraft;
- b. visual flight operations in reduced visibility conditions;
- c. recovery from unexpected loss of visibility;
- d. flight operations at low level;

- e. obstacle avoidance.
 - f. wildland fire behavior and firefighting techniques.
- 8.4. The Aircraft Operator should ensure objectivity in the training and evaluation program is maintained by assuring, where appropriate:
- a. evaluations administered in conjunction with simulator, aircraft and/or line training are conducted by different organizations or individuals than those that conducted the training;
 - b. instructors, evaluators and check pilots conduct rigorous, unbiased and objective evaluation activities.
- 8.5. The Aircraft Operator must have a Training Manual for the use of flight operations personnel, which may be issued in separate parts, that contains the details of all relevant training programs, policies, procedures, requirements and other guidance or information necessary to administer the Aircraft Operator's Training Program. Where required the Training Manual must be approved or accepted by the Authority.
- 8.6. If the Aircraft Operator utilizes pilot flight crew members designated to perform duties from either control seat, the Aircraft Operator should have seat-specific qualification for such flight crew members, to include training and an evaluation. Such training and evaluation shall be completed during initial ground and simulator training (if available) and subsequently during recurrent training at least once every calendar year.
- 8.7. If the Aircraft Operator conducts passenger flights without cabin crew, the Aircraft Operator must ensure that flight crew members, during initial training and subsequently during recurrent training at least every two (2) calendar years, complete training to ensure competence in the performance of any assigned duties and functions related to passenger cabin safety and security.
- 8.8. The Aircraft Operator must ensure that each pilot flight crew member, in order to maintain qualification, receives training, and when applicable, successfully completes a proficiency evaluation at or above the standards stipulated in the training syllabus and administered by an evaluator of the Aircraft Operator or a representative of the Authority, and demonstrates technique and competence to execute the required fire aviation procedures.
- 8.9. The Aircraft Operator must ensure pilot flight crew members complete a Command Training and Evaluation program during initial training and qualification and prior to being assigned as PIC in operations.
- a. duties and responsibilities;
 - b. relevant legislation and regulations;
 - c. authorized operations;
 - d. relevant documentation.
- 8.10. If the Aircraft Operator utilizes flight crew members to concurrently operate aircraft of different types, or operate variants within one type, the Aircraft Operator must have qualification processes that are approved or accepted by the Authority and must ensure such flight crew members complete training and an evaluation that emphasizes the differences between aircraft types and variants. Such training and

evaluation shall be completed during initial ground, simulator and line training, and subsequently during recurrent simulator training once every calendar year.

- 8.11. The Aircraft Operator should have guidance, published in the OM and a training program to equip flight crews to properly manage non-normal situations through the use of crew resource management, including :
- a. prioritization;
 - b. task sharing;
 - c. division of Pilot-Not-Flying/Pilot-Flying duties;
 - d. crew coordination.
- 8.12. The Aircraft Operator must ensure flight crew members complete Aircraft Operator familiarization training during initial ground training and prior to being assigned to duties in line operations. Such training shall ensure familiarity with:
- a. duties and responsibilities;
 - b. relevant legislation and regulations;
 - c. authorized operations;
 - d. relevant documentation.

9. Flight Operations - general

- 9.1. The Aircraft Operator must ensure that flight crew members will not operate an aircraft unless issued a medical assessment in accordance with requirements of the Authority; such assessment should be valid for a period no greater than 12 months.
- 9.2. The Aircraft Operator must have systems and procedures in place to manage risks associated with flight crew fatigue.
- 9.3. Fatigue management procedures should have flight time and duty period limitations as well as a rest period scheme for flight crew members that are published or referenced in the OM and ensure fatigue occurring either in one flight, successive flights or accumulated over a period of time does not endanger the safety of flight operations. Such limitations shall be in accordance with applicable regulations, or approved or accepted by the Authority.
- 9.4. The Aircraft Operator must have a policy and procedures that effectively mitigate the risks associated with the use by flight crew crewmembers of substances that may adversely affect performance.
- 9.5. The Aircraft Operator must have a policy and procedures to address wilful and deliberate violation of flight operations policies and/or procedures.
- 9.6. If the supernumeraries may be transported in either the passenger cabin or in the cockpit, the Aircraft Operator must have a written policy and procedures for such transport.

- 9.7. The Aircraft Operator should have procedures, published in the OM, that require the use of checklists by the flight crew prior to, during and after all phases of flight operations, and in abnormal and emergency situations, to ensure compliance with:
- a. procedures contained in the OM;
 - b. provisions of the aircraft certificate of airworthiness.
- 9.8. The Aircraft Operator shall have guidance and criteria, published in the OM, that address the pairing of inexperienced pilot crew members and ensure scheduling processes prevent inexperienced pilot flight crew members, as defined by the Aircraft Operator or the Authority, from operating together.
- 9.9. The Aircraft Operator must have a process to ensure the PIC records for each flight, a description of any known or suspected defects that affect operation of the aircraft.
- 9.10. The Aircraft Operator should have guidance and procedures, published in the OM, that ensure the proper reset of circuit breakers after a system malfunction or trip. Such guidance should, as a minimum, specify when and how often tripped circuit breakers may be reset.
- 9.11. The Aircraft Operator must ensure all aircraft in its fleet utilized for over-water flights are equipped with a minimum of one life jacket or equivalent individual flotation device for each person onboard, with each life jacket or flotation device stowed for easy accessibility from individual seating positions.

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Feedback to improve this guide is welcome
Contact: IFAWG Secretariat or manual@nafc.org.au

International Fire Aviation Working Group

PRACTICE GUIDE AO2.5

Aircraft Operator Aircraft Dispatch

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding dispatch procedures for use by Aircraft Operators who conduct aerial operations at fires.

Please note: The word “dispatch” is commonly used around the world to refer to both:

- a) *an Aircraft Operator’s internal procedures to ready and mobilise an aircraft for flight; and/or*
- b) *a Fire Agency’s request for an aircraft to proceed to undertake a task.*

In this Practice Guide, “dispatch” refers only to the Aircraft Operator’s internal aircraft mobilisation function.

“Operational Control” includes the dispatching and related ground-based functions that operationally assist the flight crew to manage the operational safety and security of the aircraft.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe and effective operation of aircraft in fire management, the organisation operating the aircraft requires rigorous systems and procedures for dispatching aircraft.
- 1.2. In order to manage the risks associated with sharing of aircraft resources between States through bilateral or multilateral agreements, it is important that certain standards are in place for the operator of the aircraft. This Practice Guide sets out the minimum recommended standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. General requirements

- 2.1. The Aircraft Operator must maintain a system for dispatching aircraft to undertake tasks for the Fire Agency, that ensures:
- a. management of safety and security in flight operations;
 - b. effectiveness and efficiency of flight operations;
 - c. appropriate authorization or approval for all flights;
 - d. appropriate supervision and control of all flights, operational control functions and other associated activities;
 - e. compliance with standards of the Aircraft Operator and requirements of the the state Civil or Military Aviation Authority (the Authority) or other applicable authorities.
- 2.2. The Aircraft Operator must ensure, in the event of an emergency situation that endangers the safety of the aircraft or persons, and which becomes known first to the Aircraft Operator, actions will be implemented to include:
- a. initiation of emergency procedures, as outlined in Emergency Response Plans or in the Operations Manual (OM);
 - b. notification to the appropriate authorities, without delay, of the nature of the situation;
 - c. a request for assistance, if required.

3. Dispatch system requirements

- 3.1. The Aircraft Operator should have a communication system that enables an exchange of information relevant to operational control throughout the management system and in geographical areas where operations are conducted.
- 3.2. The Aircraft Operator shall have a system that ensures operational control personnel and aircrew have access to information relevant to the safe conduct of each flight, including for example information associated with:
- a. the aircraft (for example: Minimum Equipment Lists, Maintenance Releases)
 - b. flight crew (for example: qualifications, competency, rostering/fatigue status)
 - c. objectives of the flight, and expected tasks;
 - d. meteorology (departure, destination and en-route; actual and forecast);
 - e. routes, including over water and critical terrain
 - f. NOTAMs and other operational guidance covering, for example facilities, outages etc;
 - g. Air Traffic Services (ATS).
 - h. Safety (current accident and incident notification procedures);

- 3.3. The Aircraft Operator shall have a dispatch process to ensure the flight crew is provided with all documents, information and data necessary for the safe conduct of the flight.
- 3.4. The Aircraft Operator shall have guidance and procedures, published in the OM, to ensure, before a flight is commenced, that meteorological conditions and expected delays are taken into account, and that:
- a. the aircraft carries sufficient required fuel and oil to ensure it can safely complete the flight;
 - b. appropriate reserve fuel is carried to provide for contingencies.
- 3.5. The Aircraft Operator must have guidance and procedures, published in the OM, to ensure a planned flight does not exceed maximum performance takeoff and landing weight or balance limits, based upon environmental conditions expected at the times of departure and arrival.
- 3.6. The Aircraft Operator shall ensure that suitably trained, qualified personnel perform aircraft weight and balance calculations,
- 3.7. The Aircraft Operator shall have guidance and procedures, published in the OM, to ensure a flight to be operated in known or expected icing conditions shall not be commenced unless the aircraft is certificated and equipped to be operated in such conditions.
- 3.8. The Aircraft Operator shall have guidance and procedures, published in the OM, to ensure a suitable alternate airport or landing site is selected and specified whenever either:
- a. the weather conditions at the departure airport or site are at or below the applicable landing minima, or
 - b. other operational conditions exist that would preclude a return to the departure airport or site; or
 - c. the forecast weather conditions at the destination airport or site are at or below the applicable landing minima, or
 - d. other operational conditions exist that may preclude a landing At the destination.
- 3.9. The Aircraft Operator should have a system of operational control that includes flight monitoring for the duration of a flight and ensures timely notification to the Aircraft Operator of en route flight movement and/or significant deviation from the operational flight plan.
- 3.10. The Aircraft Operator should have the necessary facilities, workspace, equipment and supporting services, as well as work environment, to satisfy dispatching and operational control safety and security requirements.
- 3.11. The Aircraft Operator must have a process to record and retain, for a period of time determined by the Aircraft Operator or the Authority, operational information and data for each flight.

4. Dispatch personnel

- 4.1. The Aircraft Operator must ensure that management and non-management dispatching and operational control positions within the organization that perform functions relevant to the operational safety of flights are filled by personnel on the basis of knowledge, skills, training and experience appropriate for the position.
- 4.2. The Aircraft Operator must ensure that personnel undertaking dispatching and operational control functions are required to demonstrate the capability of speaking and reading in a language that will permit communication with other relevant areas within the organization.
- 4.3. The Aircraft Operator must have a training program, approved or accepted by the Authority, to ensure that dispatching and operational control personnel are competent to perform any assigned duties relevant to operational control. Such program shall, as a minimum, address:
 - a. initial qualification;
 - b. continuing qualification;
 - c. maintenance of proficiency;
 - d. assessment and checking.
- 4.4. The Aircraft Operator shall ensure that personnel who have not performed dispatch functions for a period of 12 consecutive months or greater are not assigned to perform duties until re-qualified, by demonstrating required knowledge and/or proficiency.

5. Dispatch quality and safety assurance

- 5.1. The Aircraft Operator should have a quality assurance program that provides for the auditing and evaluation of operational control functions at planned intervals to ensure the organization(s) with responsibility for operational control is(are):
 - a. complying with applicable regulations and with standards of the Aircraft Operator;
 - b. satisfying stated operational control needs;
 - c. identifying undesirable conditions and areas requiring improvement;
 - d. identifying hazards to operations.
- 5.2. The Aircraft Operator should have processes implemented for dispatching and operational control of flights that include a combination of reactive and proactive methods for safety data collection and analysis to ensure existing and potential hazards to aircraft operations are identified.
- 5.3. The Aircraft Operator should have an operational reporting system implemented in the organization that:
 - a. encourages and facilitates feedback from dispatching and operational control personnel to report safety hazards, expose safety deficiencies and raise safety or security concerns;

- b. includes analysis and action to address operational deficiencies, hazards, incidents and concerns identified through the reporting system.

-end-

Feedback to improve this guide is welcome

Contact: IFAWG Secretariat or manual@nafc.org.au

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International Fire Aviation Working Group

PRACTICE GUIDE AO2.6

Aircraft Security

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding aircraft security procedures for Aircraft Operators who conduct aerial operations at fires.

Please note: The word “security” is sometimes used interchangeably with “safety”, especially when translated from languages other than English.

In this Practice Guide, “security” refers primarily to the Aircraft Operator’s procedures prevent unlawful or inappropriate interference with aircraft..

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe, reliable and effective operation of aircraft in fire management, the organisation operating the aircraft requires systems and procedures for ensuring the security of aircraft.
- 1.2. This Practice Guide sets out the minimum recommended standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. Security Program

- 2.1. The Aircraft Operator must have a Security Program with a security management and control system that ensures:
 - a. supervision and control of functions and activities associated with the Security Program;
 - b. compliance with standards of the Aircraft Operator and the aviation security requirements of the state Civil or Military Aviation Authority (the Authority) or other applicable security control authorities including, where appropriate, the aviation security requirements of any host nation or jurisdiction.

- 2.2. The Aircraft Operator should have a management official designated as the head of security with direct access to the highest level of management within the organization. Such management official, regardless of reporting structure, shall have the responsibility, and thus be accountable, for ensuring the implementation and maintenance of the Security Program.
- 2.3. The Aircraft Operator must have a communication system that enables an exchange of information relevant to operational security throughout the management system and in all locations or areas where operations are conducted.
- 2.4. If the Aircraft Operator has external service providers conduct outsourced operational security functions, the Aircraft Operator must have processes to monitor such external service providers to ensure compliance with:
- a. the Security Program of the Aircraft Operator;
 - b. the requirements of applicable aviation and other relevant security authorities.
- 2.5. The Security Program of the Aircraft Operator should include an operational reporting system that encourages and facilitates personnel to report security incidents and threats, identify security deficiencies, and raise security concerns.
- 2.6. The Security Program of the Aircraft Operator must specify a security training program that includes initial and recurrent training, which shall be in accordance with requirements of the aviation security program of the Authority or State and applicable requirements of other states where operations are conducted. The security training program shall have a balanced curriculum of theoretical and practical training to ensure:
- a. Personnel employed by or under the control of the Aircraft Operator who implement security controls are suitably competent to perform their duties;
 - b. Crew members and frontline ground handling personnel are able to act in the most appropriate manner to minimize the consequences of acts of unlawful interference and/or disruptive passenger behavior.
- 2.7. The Security Program of the Aircraft Operator shall include all reasonable measures to prevent unlawful, unauthorised or inappropriate access to aircraft, maintenance facilities, storage facilities, equipment, stores and supplies.

3. General Requirements

- 3.1. The Aircraft Operator should ensure operational personnel complete security awareness training that focuses on preventative measures and techniques in relation to access to aircraft, access to storage facilities, equipment, stores and supplies intended for transport on aircraft, as applicable, and empowers such personnel to contribute to the prevention of acts of sabotage and other forms of unlawful interference.
- 3.2. The Aircraft Operator must ensure an identification verification system is in place that prevents personnel and vehicles from unauthorized access into airside areas and security restricted areas that are under the control of the Aircraft Operator.

- 3.3. The Aircraft Operator must ensure measures are in place that provide for the control and supervision of the movement of personnel and vehicles to and from the aircraft in security restricted areas and prevent unauthorized access to the aircraft
- 3.4. The Aircraft Operator must ensure measures are in place to prevent the introduction of unauthorized weapons, explosives or other dangerous devices or items on board an aircraft by any persons.

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Feedback to improve this guide is welcome

Contact: IFAWG Secretariat or manual@nafc.org.au

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International Fire Aviation Working Group

PRACTICE GUIDE AO2.7

Aircraft Ground Handling

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance regarding procedures for handling aircraft ground by Aircraft Operators who conduct aerial operations at fires.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safe, secure and reliable operation of aircraft in fire management, the organisation operating the aircraft requires appropriate procedures for handling aircraft on the ground.
- 1.2. This Practice Guide sets out the minimum recommended standards acceptable for Aircraft Operators providing aircraft under resource sharing agreements.

2. General requirements

- 2.1. The Aircraft Operator must have a management system that ensures control of ground handling operations and the management of safety and security outcomes.
- 2.2. The Aircraft Operator should have a manager for ground handling operations that:
 - a. has the authority and is responsible for the management and supervision of functions and activities within the scope of ground handling operations;
 - b. is accountable to senior management for ensuring the safety and security of ground handling operations.

The Aircraft Operator must have a communication system that enables an effective exchange of information relevant to the conduct of ground handling operations throughout the management system for ground handling operations and among operational personnel.

- 2.3. The Aircraft Operator must ensure the existence of the necessary facilities, workspace, equipment and supporting services, as well as work environment, to satisfy ground handling operational safety and security requirements.
- 2.4. The Aircraft Operator must ensure operational positions within the scope of ground handling operations are filled by personnel on the basis of knowledge, skills, training and experience appropriate for the position.
- 2.5. The Aircraft Operator must have a system for the management and control of documentation and/or data used directly in the conduct or support of ground handling operations.
- 2.6. The Aircraft Operator should have processes implemented in the ground handling operations organization that include a combination of reactive and proactive methods for safety data collection and analysis to ensure existing and potential hazards to aircraft operations are identified.
- 2.7. The Aircraft Operator should have an operational reporting system implemented in the ground handling operations organization that:
- a. encourages and facilitates feedback from ground operations personnel to report safety hazards, expose safety deficiencies and raise safety or security concerns;
 - b. includes analysis and ground operations management action to address operational deficiencies, hazards, incidents and concerns identified through the reporting system.
- 2.8. The Aircraft Operator must have a process to ensure ground handling personnel assigned to perform ground handling duties in airside operations for the Aircraft Operator, to include the operation of ground support equipment, complete initial and recurrent airside safety training.
- 2.9. The Aircraft Operator must have a process to ensure ground handling personnel assigned to perform aircraft fuelling operations for the Aircraft Operator complete initial and recurrent training.
- 2.10. The Aircraft Operator must ensure safety procedures are implemented during aircraft arrival and departure ground movement operations.
- 2.11. The Aircraft Operator must ensure procedures are in place for an inspection of the aircraft immediately prior to departure for the purpose of identifying, documenting and, as applicable, reporting external aircraft damage.
- 2.12. The Aircraft Operator must ensure procedures are in place for securing an aircraft prior to overnight or layover parking.
- 2.13. The Aircraft Operator must ensure a Load Control system is in place that provides for:
- a. aircraft weight and balance conditions that are correct and within limits;
 - b. aircraft loaded in accordance with applicable regulations and specific loading instructions for the flight and for the retardant or foam as applicable;

confirming that loading information, including any last minute changes, is in agreement with the actual load on the aircraft and presented on a final loadsheet.

- 2.14. The Aircraft Operator should ensure a process is in place that assures only qualified and authorized personnel are permitted to operate ground support equipment
- 2.15. The Aircraft Operator should ensure an emergency management plan is in place for responding to accidents or other emergencies that may occur during aircraft ground handling operations.
- 2.16. The Aircraft Operator must ensure, during aircraft fuelling operations:
 - a. fire extinguishing equipment suitable for at least initial intervention in the event of a fuel fire is readily available, and personnel have been trained in the use of such equipment;
 - b. fire extinguishing equipment meets the standards of the Aircraft Operator and any regulations of the State.
 - c. procedures are in place for quickly summoning the rescue and fire fighting service in the event of a fire or major fuel spill.

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Feedback to improve this guide is welcome
Contact: IFAWG Secretariat or manual@nafc.org.au



United Nations
International Strategy for Disaster Reduction

International Fire Aviation Working Group

PRACTICE GUIDE AM4.1

Air Operations Management Structures

See new draft – attached - Incident Control System (ICS) v2 Sep 2017

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International Fire Aviation Working Group

PRACTICE GUIDE AM4.2

Emergency Response Planning

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose

To provide guidance to Fire Agencies and Aircraft Operators regarding planning for response to emergencies such as a serious accident or crash involving an aircraft that is engaged in fire aviation, or other event that results in fatalities, serious injuries or damage.

Application

- Fire Agencies who manage fires that utilise aircraft.
- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safety of aircraft crews, ground crews and the public it is important that Fire Agencies and Aircraft Operators comprehensively plan for response to emergencies such as a serious accident that involves aircraft operating at a fire. Although other agencies may have particular responsibilities for responding to emergencies, it is also possible that personnel from the Fire Agency or Aircraft Operator may be at the emergency scene before other responders.

2. Requirement for Emergency Response Plans

- 2.1. All Fire Agencies and all Aircraft Operators must have a written plan or a set of plans for responding to emergencies, including accidents involving aircraft engaged in fire operations.
- 2.2. The objective of the Emergency Response Plans is to provide direction to Fire Agency and Aircraft Operator personnel in the event that they become aware of an emergency, for example a serious accident involving fire aircraft.
- 2.3. Separate Emergency Response Plans should be prepared and maintained by the Fire Agency and the Aircraft Operator.

2.4. In preparing plans, Fire Agencies and Aircraft Operators must give consideration to the need for separate detailed plans for different levels of their organisation e.g. for SCCF and RCCFs or regional offices.

2.5. Plans must clearly set out the responsibilities for carrying out the tasks.

3. Recommended content of Emergency Response Plans

3.1. When preparing plans consideration should be given to include the following:

- a. Definitions and Abbreviations.
- b. Applicability (i.e. to which personnel and organisations does the plan apply).
- c. Responsibilities.
- d. Procedures (including contact details) for providing notification of the emergency to:
 - i. the Authority or service legally responsible in the State for response to the particular type of emergency;
 - ii. Fire Agency, including SCCF, RCCF and IMT as required;
 - iii. senior personnel in relevant organisations;
 - iv. relevant authorities, such as the State CAA;
 - v. Aircraft Operator, if applicable; and
 - vi. relatives and colleagues of persons affected.
- e. Procedures (including contact details) for arranging assistance, including:
 - i. first aid;
 - ii. casualty retrieval, ambulance, air ambulance or rescue service;
 - iii. medical assistance.
- f. Guidance for Fire Agency and/or Aircraft Operator personnel responding to an emergency or accident scene, including:
 - i. procedures for removing victims from wreckage and providing treatment;
 - ii. procedures for dealing with hazards that may be encountered at an accident site, including: fuel, toxic substances, pressure vessels, ballistic recovery devices, pyrotechnics, dangerous goods;
 - iii. procedures for protecting the environment at an accident site e.g from fuel spills;
 - iv. protection of the site for accident investigation
 - v. provision of security for the site

- vi. identification and protection of flight data recorders
 - vii. keeping of records, including photographs; and
 - viii. collection of evidence for investigative purposes.
- g. Means for replacing aircraft or personnel that are no longer available to perform originally assigned tasks due to an accident or other emergency or due to the requirement to respond to an emergency.
 - h. Procedures and responsibilities for dealing with the media.
 - i. Initiation of accident investigation process.
 - j. Procedure for immediately quarantining fuel or other equipment that may have contributed to an aircraft accident or other emergency.
 - k. In the case of an aircraft accident, a process to consider whether other aircraft of a similar type, other aircraft operating in similar conditions or other aircraft operated by the Aircraft Operator should be directed to cease operating for a period of time.
 - l. General guidance for Fire Agency and/or Aircraft Operator personnel regarding:
 - i. communication procedures, including
 - A. means of communications; and
 - B. communication protocols (e.g avoiding use of names of deceased or injured in unencrypted radio communications).
 - ii. the requirement to maintain accurate, detailed records of communications and actions; and
 - iii. procedures for maintaining and storing records, including photographs.
 - m. Procedure for provision of short-term and long-term counselling and psychological support for personnel involved.

4. Exercising and testing Emergency Response Plans

- 4.1. Fire Agencies and Aircraft Operators should regularly schedule practice emergency response exercises that also serve to test Emergency Response Plans.

5. Responsibility and timetable for review and update

- 5.1. Fire Agencies and Aircraft Operators preparing Emergency Response Plans must establish procedures, responsibilities and a timetable to review and update these plans.
- 5.2. Emergency Response Plans must be reviewed at least every 12 months.

6. Provision of data and analysis

- 6.1. At an appropriate time following the emergency, Fire Agencies and Aircraft Operators should consider providing information regarding the emergency to other agencies or Aircraft Operators that may be in a position to learn from the event and prevent similar occurrences. In some circumstances, this may be urgent.
- 6.2. In the case of an aircraft accident, at an appropriate time Fire Agencies and Aircraft Operators should provide information and analysis to appropriate accident databases, such as the database of fire aviation accidents maintained by IFAWG.

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Feedback to improve this guide is welcome

Contact: IFAWG Secretariat or manual@nafc.org.au

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International Fire Aviation Working Group

PRACTICE GUIDE AM4.4

Operational Risk Management

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose

To provide guidance to Fire Agencies and Aircraft Operators regarding management and control of operational risks during fire aviation operations in order to reduce the possibility fatalities, injuries or damage to aircraft and property.

Application

- Fire Agencies who manage fires that utilise aircraft.
- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

- 1.1. To ensure the safety of aircraft crews, ground crews and the public it is important that Fire Agencies and Aircraft Operators manage and reduce the operational risks associated with fire aviation operations.

2. Risk Identification

[Drafting not yet completed, but is underway]

[Drafting note – this Practice Guide, when completed, is intended to provide

- Guidance regarding the need for Aircraft Operators and Fire Agencies to have an Operational Risk Management program as part of their overall approach to safety management

- Guidance regarding identification of key risks using a typical likelihood versus consequence matrix

- Guidance regarding risk reduction risk treatment plans

- Discussion of treatments for “traditional” fire aviation operational risks that have been identified. As a starting point some possible elements provided in brown text below to illustrate possible content for this Practice Guide]

DRAFT for DISCUSSION

This DRAFT material has been guided in part by the BARS Standards prepared by the Aviation Safety Foundation (refer: http://flightsafety.org/files/bars/bars_v4.pdf)

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1. Situations known to pose particular safety risks in aerial firefighting operations include, but are not limited to the following:
 - a. mid-air proximity or collision (including between firefighting aircraft, or between firefighting aircraft and itinerant aircraft);
 - b. runway or landing area overrun or excursion on landing or takeoff (aeroplane);
 - c. dynamic rollover, uneven landing surfaces (helicopter);
 - d. settling with power or overpitching (helicopter);
 - e. failing to climb under excessive downdraft conditions;
 - f. manoeuvring whilst heavily loaded, leading to incipient stall and spin (aeroplane);
 - g. operating in the height/velocity curve, loss of tail rotor effectiveness, vortex ring state (helicopter);
 - h. exceeding weight limitations and centre of gravity limitations;
 - i. bad weather including excessive winds, turbulence and Pyro Cu/Cb
 - j. turbulence;
 - k. mishandling of aircraft during on-water operations (scooping aircraft);
 - l. ground handling, collision with objects during ground handling or ground manoeuvring;
 - m. ground risks particularly including risks posed by moving aircraft, propellers, rotors and downwash;
 - n. dropping articles from aircraft.
 - o. crew fatigue;
 - p. sleep inertia;
 - q. dehydration and heat stress.
 2. Generically, the main risks encountered in aerial firefighting operations can be represented as:

RISK	Includes:
Fuel Contamination	

Fuel Exhaustion	
Fuelling incident	
Collision with person on ground	Rotor/propeller accidents
Taxiing collision with object	
Ground resonance (RW)	
Overloading	
Incorrect loading	C of G issues
Runway excursion (FW)	
Engine failure during TO	
Engine failure after TO	
Bird strike	
Controlled flight into terrain	Collision with vegetation Wire strike Blade strike Bucket caught in trees
Un-controlled flight into terrain	Turbulence, vortex Inadvertent entry to IMC
Collision with water during fill (FW and RW)	Glassy water
Incorrect on-water handling during taxing etc (FW scooping) resting in collision with water or submersion	
Mid air collision	Between Fire Aircraft With itinerant or other aircraft
Dropped article	Dropped bucket Firebombing drop injures person on ground)
Airframe structural failure or failure of controls	

Engine failure leading to outlanding in unsuitable terrain	
Rappel rope or winch cable caught in ground obstacle	
Specialist mission equipment failure (eg rope or cable)	
On board fire	From incendiary device/dispenser
Night flight risks	NVG

3. **Common risk controls include:**

CONTROLS	Includes:
Aircraft Operator standards	Safety Management Systems
Landing/TO area standards	
Dynamic risk assessment systems	
Flight crew qualifications and competence	
Flight crew experience and recency	
Flight and duty time management	
Impairment management	
Aircraft airworthiness standards	
Aircraft maintenance standards	
Aircraft performance standards	No and type of engines, reserve power available
Aircraft equipment standards	Equipment carried (eg ELT, survival equipment)
PPE	Flight helmets
Seatbelts	4 point/5 point, Upper torso restraint

Qualifications and competence of aircrew and aerial fire crews	Winch operators, helitack crews etc
Qualifications and competence of Fire Agency management, supervision and support personnel	
Operational management and support systems	Traffic management Communications Flight following

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PRACTICE GUIDE AM4.5

Dynamic Risk Management

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose

To provide guidance primarily to Aircraft Operators regarding dynamic risk assessment and management practices.

Application

- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.
- Agencies who manage fires that utilise aircraft or who provide support to fire aviation.

1. Introduction

- 1.1. To ensure the safety of aircraft crews, ground crews and the public it is important that Aircraft Operators manage and reduce the operational risks associated with fire aviation operations.
- 1.2. Fire Aviation is often conducted under dynamic conditions where circumstances are constantly changing, requiring regular assessment and re-assessment of risks and appropriate adjustments of risk controls. Some risk management practices traditionally employed in aviation are not necessarily well suited to circumstances where the situation is constantly changing and evolving.
- 1.3. Dynamic risk management practices are designed to provide Air Crew and ground support personnel with tools and strategies to maintain an appropriate level of safety and risk management during changing situations.

2. Background

- 2.1. Dynamic risk management is the continuous assessment and control of risk in changing circumstances.
- 2.2. The concept of dynamic risk management has particular applicability in fire and emergency aviation, where it is normal for circumstances to be changing constantly. For example, it is not at all uncommon to see changes in the objectives of a particular mission, the location or area of operations, the destination, the weather or the

behaviour of the fire, to name just a few. Some of the risk controls that are commonly applied in other sectors of aviation are not able to readily applied in fire aviation. A simple example is that a risk control often applied in airline flying is to authorise pilots to fly specific routes only after having a senior pilot conduct a route check or line check on that particular route. Clearly, checks on fixed routes are not practical in fire aviation.

- 2.3. Similarly, some regularly used approaches to workplace safety – such as Job Safety Analysis are often designed around static situations and do not necessarily deal well with more dynamic events.
- 2.4. Most personnel involved in fire aviation, whether in the air or on the ground, will normally be intuitively, perhaps subconsciously, undertaking dynamic risk management in any case. However experience has demonstrated that there are benefits in promoting and embedding dynamic risk management as a more formal, regularly-applied practice in fire aviation.
- 2.5. The problem of “emergency-itis” or “press-on-it is” has been identified as a particularly significant risk in fire and emergency aviation. This phenomenon sees pilots or other personnel experiencing perceived pressure to continue or complete a mission that is otherwise inadvisable due to the level of risk. Application of dynamic risk management can provide some defence against emergency-itis, by identifying decision points where risks are re-assessed and a conscious decision is made to continue or discontinue.

3. Dynamic Risk Management

- 3.1. Aircraft Operators and Fire Agencies are encouraged to implement dynamic risk assessment and management practices for appropriate fire aviation activities.
- 3.2. Different Fire Agencies and Aircraft Operators will necessarily have different approaches to implementing dynamic risk management, tailored to their organisation’s circumstances and practices. This Practice Guide aims only to provide some examples and principles that can be used to design and implement specific approaches.
- 3.3. Although dynamic risk management is routinely applied to flight activities, and most examples relate to flight, there are considerable benefits in routinely applying forms of dynamic risk management to ground support activities. For example a re-assessment of risks may result in a decision to move or re-configure an airbase, or to alter refuelling practices.

4. Key steps in Dynamic Risk Management

- 4.1. The first underlying principle in dynamic risk management is that an *initial risk assessment* (sometimes referred to as a *reference risk assessment*) is made for the proposed activity, before that activity is commenced. Based on the initial risk assessment, a decision is made to either:
 - i. continue the activity, or
 - ii. continue the activity with additional risk controls; or
 - iii. discontinue the activity and seek a viable alternative approach.

An example of a tool that could be used for initial risk assessment of flight activities is provided at Addendum 1 to this Practice Guide.

4.2. The second principle is that risk assessment points are identified for the activity. Upon reaching each assessment point, a re-assessment of key risks is triggered. Assessment points may be either:

- i. fixed assessment points (for example: arrival at the area of operations) that apply to every flight; or
- ii. variable assessment points (for example: the mission objectives have changed, or the prevailing wind direction has changed significantly).

Most dynamic risk assessment processes will prescribe the use of a mixture of fixed and variable assessment points.

4.3. At each assessment point a judgement is made that either;

- i. risks do not differ significantly from the initial or reference assessment; or
- ii. there has been a change in a key risk(s).

4.4. Where a change in risk is identified, there is a decision point where:

- i. a conscious decision is made to accept the changed level of risk and proceed with the task, or
- ii. there is a need to implement additional risks controls; or
- iii. the task should be discontinued and alternative approaches considered.

4.5. It is emphasised that risk assessments do not necessarily have to be written, indeed it would be impractical in many circumstances to require written assessments or forms to be completed. However any dynamic risk assessment process should strive to ingrain the practice of continually identifying changed circumstances and assessing and re-assessing the risks and risk controls, and then making a conscious decision to continue or otherwise.

4.6. Dynamic risk assessment processes can be supported by simple tools, such as checklists or placards, or process steps may also be incorporated into other checklists (e.g pre-flight checklists, top-of-descent checklists).

ADDEDUM 1

Example of an initial risk assessment tool

	RISK LEVEL			Notes
	Low	Medium	High	
Environment				
Weather				
Cloud				
Visibility				
Wind				
Temperature				
Operating area				
Smoke				
Turbulence				
Terrain				
Altitude				
Density				
Obstructions				
Ground environment				
Emergency landing				
Familiarity				
Aircraft				
Serviceability				
Weight				
CG				
Performance				
Fuel				
Operation				
Task				
Other aircraft				
Crew Members				
Experience				
Recency				
Fatigue				
Stress				
Crew cooperation				
Workload				
Flight & duty time				
Equipment				
Navigation				
Sling load				
Long line				
Overall total				

Date _____ Pilot _____

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PRACTICE GUIDE FO5.3

Flight Notification and Flight Following

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose of this guide

To provide guidance to Fire Agencies and Aircraft Operators regarding the Flight Notification and Flight Following recommendations that should be followed when undertaking fire aviation operations.

Application

- Fire Agencies utilising aircraft in fire management operations.
- Aircraft Operators operating aircraft in support of fire management activities.

1. Introduction

- 1.1. Fire aviation operations demand increased attention to monitoring the status and progress of flights beyond the above the standard that may apply to other aviation activities.
- 1.2. The dynamic nature of fire aviation along with increased exposure to potential risks demands that extra precautions should be taken to ensure that well-being of all aircraft and crew, to avoid any uncertainty about their whereabouts and to ensure effective Search and Rescue when required.
- 1.3. As part of the overall management of risk of fire aviation, Fire Agencies and Aircraft Operators must cooperate to put in place systems of:
 - a. **Flight Notification**, whereby for every flight undertaken the details of the flight plan, objectives of the flight and all persons on board the aircraft are available to ground support personnel at all times during the flight; and
 - b. **Flight Following**, whereby the progress of every flight is monitored by a responsible person on the ground by either electronic or procedural means, and whereby appropriate Search and Rescue action is initiated if there is any doubt as to the safety of the aircraft or crew.

2. Flight Notification

- 2.1. Fire Agencies must have a procedure that requires the notification of each flight that is conducted on behalf of that Agency.

- 2.2. The Flight Notification procedures must require that the Notification is provided before the operation commences, and must require that the details of the flight notification are retained on the ground and are easily accessible to persons who may need to initiate or support Search and Rescue operations.
- 2.3. Flight Notification may be provided through electronic means, by radio or telephone communications or by the use of a written form.
- 2.4. A Flight Notification procedure should normally require that the pilot be responsible for ensuring the provision of Flight Notification. Where a Fire Agency operates a formal aircraft dispatching function, the dispatcher may arrange the Notification on behalf of the pilot, however the procedure should still require the pilot to ensure that Flight Notification has been arranged.
- 2.5. Although the requirement for Flight Notification may be reduced where a flight is monitored by an Air Traffic Control agency or where local Civil Aviation or Military Aviation authorities require a formal flight plan to be, it is recommended that the Fire Agency still enact a Flight Notification procedure. Although the primary purpose of Flight Notification is to enhance aircraft safety and to expedite Search and Rescue, the procedure also provides administration records, and information for evaluating effectiveness, efficiency and cost of operations
- 2.6. Flight Notifications should be provided and recorded in a standardised format, containing at least the following:
- a. aircraft details:
 - i. aircraft manufacturer and model
 - ii. aircraft registration
 - iii. tactical callsign
 - iv. details of communication equipment including contact numbers for satphones, cellphones etc
 - v. True Air Speed at cruise
 - vi. total flight endurance.
 - b. crew and passenger details
 - i. pilot(s) name(s)
 - ii. pilot(s) satphone, cellphone details or other contact details
 - iii. names of other crew
 - iv. crew satphone, cellphone details or other contact details
 - v. names of all other persons on board the aircraft.
 - c. flight details
 - i. date
 - ii. departure point

- iii. time of departure
- iv. planned destination
- v. Estimated Time of Arrival (ETA) at destination
- vi. purpose of flight, mission objectives
- vii. Incident / Fire name or identification
- viii. flight legs and planned waypoints.

d. other [If required]

- i. name of person authorising flight
- ii. name of person submitting Flight Notification.

3. Flight Following

- 3.1. Fire Agencies must have a Flight Following procedure for monitoring the progress and safety of any flight conducted on behalf of the Agency.
- 3.2. Flight Following may be conducted by automatic (electronic) means or by manual (procedural) means, or by a combination of both.
- 3.3. Automatic Flight Following is normally based on regular, automatic transmission of GPS or GNSS derived position coordinates and related data to a ground station. Automatic Flight Following is generally equivalent to systems often referred to as Automatic Vehicle Location or “AVL”. Position data is normally transmitted over a satellite based communication system to ensure wide area communications, but may also utilise cellphone or other terrestrial data networks.
- 3.4. Experience of Fire Agencies around the world has demonstrated the value of automated Flight Following in Fire Aviation including to:
 - support manual flight following (regular position reporting) for (SAR), reducing aircrew and ground crew workload and reducing radio traffic;
 - support Search and Rescue (SAR) missions;
 - aid dispatching and resource allocation and to support resource management;
 - improve situational awareness for aircrew, fire managers and supervisors;
 - aid verification of operating times and work performed to support invoicing and accounting processes;
 - undertake basic mapping;
 - automatically provide other relevant data e.g. wind speed and direction;
 - support effective monitoring of performance of assets e.g. amount of fire control line built in a period of time; and
 - provide data for research and evaluation of fire control techniques.

In addition, the communications system that transfers data from aircraft may often provide extra functions such as messaging and voice communications.

- 3.5. It is strongly recommended that, where the technically feasible, Fire Agencies institute a system of automated Flight Following or require the Aircraft Operator to provide appropriate data from an automated Flight Following System.
- 3.6. It is strongly recommended that any bi-lateral or multi-lateral agreement for the sharing of aircraft resources require that aircraft participate in an automated Flight Following system which can be accessed by both the sending jurisdiction and the host jurisdiction. For inter-jurisdictional deployments consideration will need to be given to ensuring that the means of data communications has appropriate coverage in the host jurisdiction and along transit routes.
- 3.7. It is recommended that where automated Flight Following is implemented, that consideration be given to equipping key ground support vehicles such as refuelling vehicles and maintenance vehicles.
- 3.8. Where Automated Flight Following is used, the following standards are recommended:
 - a. position reports are acquired at intervals:
 - i. no greater than every three minutes during any flight conducted for tactical purposes;
 - ii. no greater than every ten minutes during any transit flight (i.e flights not conducting tactical operations.)
 - b. position reports are transmitted to the appropriate ground-based facility(s) within one minute of acquisition;
 - c. position reports should include, at a minimum:
 - iii. time of position acquisition
 - iv. current position (from GPS/GLONASS)
 - v. altitude
 - vi. heading or track
 - vii. ground speed.

Note: US federal agencies define a standard data message format for automated Flight Following position reports, which is also used by a number of other countries. More information is available at: <https://www.afl.gov>

- 3.9. Where Automated Flight Following is used, the Fire Agency must establish a system of monitoring automated position reports and initiating appropriate Search and Rescue procedures if there is any doubt as to the safety of the aircraft.
- 3.10. Where manual Flight Following is used, it is recommended: that
 - a. each aircraft is required to report current position and intentions:

- i. on departure;
 - ii. at intervals no greater than every 30 minutes during flight;
 - iii. at any significant change of course or change in the nature of the flight or change in the activities being conducted;
 - iv. upon any change from the plan or details contained in the Flight Notification;
 - v. upon arrival at the destination.
 - b. the position and intentions reports must be communicated to a responsible person on the ground;
 - c. the position and intentions report should contain, at a minimum:
 - i. current position
 - ii. altitude
 - iii. heading or track
 - iv. status of flight (eg “operations are normal”)
 - v. [if required] a description of intentions.
 - d. the person on the ground responsible for Flight Following must initiate appropriate Search and Rescue procedures if there is any doubt as to the safety of the aircraft.
 - e. the person on the ground who is responsible for monitoring the status and progress of the aircraft must maintain a log or record of key communications and actions.
- 3.11. For both Automated Flight Following and manual Flight Following, the system must ensure that the person responsible for monitoring the status and progress of flights and Search and Rescue if required transfers the responsibility for Flight Following to another responsible person should they be unable to continue actively monitoring any flight.
- 3.12. The Fire Agency may consider relaxing requirements for Flight Following when a flight is subject to positive monitoring by another agency, such as radar monitoring by Air Traffic Control.

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Feedback to improve this guide is welcome
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PRACTICE GUIDE 5.5

Briefings

See new draft – attached – Briefings v2 Sep 2017

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PRACTICE GUIDE 5.6

Airspace Management

This Guide is one of a series contained in the Voluntary Guidelines for Fire Aviation Part 2: the International Manual of Common Rules. Information regarding the use of this Guide and the definitions of terms used are contained in the Voluntary Guidelines.

Purpose

To provide guidance to Fire Agencies and Aircraft Operators regarding recommend practices for managing airspace around a fire or emergency incident in order to reduce the risk of collision and to maximise efficiency of operations.

Application

- Fire Agencies who manage fires that utilise aircraft.
- Aircraft Operators engaged in operating aircraft in support of fire management activities.
- Aircraft Operators providing aircraft under bi-lateral or multi-lateral resource sharing agreements.

1. Introduction

1.1.

[Drafting of this Practice Guide is not yet complete, but has commenced]

[Drafting note – this section is intended to provide guidance on procedures for managing airspace around a fire and should cover:

- *communications procedures*
- *tools for traffic management – corridors, levels etc*
- *temporary restricted airspace/danger areas*
- *procedures for working in Control Areas or working with other airspace management authorities*
- *notification procedures (Fire NOTAMS etc)*
- *assisting technology?*

etc

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PRACTICE GUIDE 5.7

Personal Protective Equipment

See new draft – attached – Personal Protective Equipment v2 Sep 2017

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PRACTICE GUIDE SO6.2

Firebombing operations

See new draft – attached – Firebombing v2 Sep 2017

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PRACTICE GUIDE CO7.1

International Deployment Procedures

See new draft – attached – CO7.1 International Deployments

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PRACTICE GUIDE 7.2

International agreement checklist

See new draft – attached – CO7.1 International Deployments

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