



**THE AVIATION INDUSTRY ASSOCIATION OF NZ (INC)**

**AIR RESCUE/AIR AMBULANCE**

**STANDARDS MANUAL**

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It is the intention that the AIA Air Rescue/Air Ambulance Division will:

- 1 be a Division representing AIA members who have an interest in search and rescue, helicopter air ambulance, fixed wing air ambulance, and organ transfer activities.
- 2 be a Division with a name which is recognisable by all authorities in the health/accident/search and rescue fields.
- 3 be tasked with communicating with all the relevant organisations in the medical, hospital, rehabilitation, funding, regulatory and enforcement areas relevant to aviation as it interfaces with accident, health and search and rescue services.
- 4 develop an industry wide forum to address all major policy issues concerning aviation search and rescue and aviation ambulance activities.
- 5 become the recognised Group for setting standards for Air Rescue/Air Ambulance activities, working as necessary in conjunction with the Royal Australasian College of Surgeons, the Australian and New Zealand College of Anaesthetists, Australasian College for Emergency Medicine (ACEM), Joint Faculty of Intensive Care Medicine (JFICM) the Ministry of Health, District Health Boards, Accident Rehabilitation and Compensation Insurance Corporation, Civil Aviation Authority, Rescue Co-ordination Centre of New Zealand, New Zealand Police, New Zealand Flight Nurses Association and such other groups as may be required from time to time.
- 6 become a centre of referral on all matters pertaining to air search and rescue/air ambulance for authorities needing to seek aviation industry views.
- 7 be a credible industry organisation representative of the viewpoints of its widely dispersed interest group of members.

## 4. POLICY

The Civil Aviation Authority has endorsed the initiative taken by the Aviation Industry Association of New Zealand Inc (AIA) to form an Air Rescue/Air Ambulance Division for the purpose of exercising more influence and control over the direction and destiny of air rescue/air ambulance services in New Zealand. AIA members involved in air rescue/air ambulance operations may now register their aircraft operated in those roles for entry on the AIA Air Rescue/Air Ambulance Register, and shall submit their Operators Procedures Manual for assessment by the AIA independent auditor in accordance with the requirements set out in Annex G. While CAA does not have a direct regulatory involvement in the AIA Air Rescue/Air Ambulance Standards, it is involved at AIA's request in assisting AIA in formulating the standards. The Civil Aviation Authority sees benefit of the standards in raising the safety standards of the air rescue/air ambulance operators.

The direct involvement in CAA in the air rescue/air ambulance operations in New Zealand is through its auditing of the service providers to establish compliance with the CAA Rules and conformance with the AIA Standards through the incorporation of those standards in the operators' Expositions. The CAA still audits all service providers on an annual basis to establish their compliance with the CAA Rules and their exposition.

The purpose of this Manual is to promulgate AIA Air Rescue/Air Ambulance Standards. The Standards are defined according to aircraft operation categories and include minimum listings of role and medical equipment, as well as crewing requirements. The manual also prescribes pilot and medical attendant training courses, and the AIA approved audit procedures to assess operator compliance with the Standards.

**Note: The Standards do not absolve any operator from CAA airworthiness requirements and/or approvals for any aircraft modifications. Any equipment carried on board shall be adequately and securely stowed and restrained, and the appropriate calculations made regarding the weight and balance of the aircraft.**

The Standards have been developed by AIA in consultation with ACC, Health, Ambulance and SAR authorities and members of the Air Rescue/Air Ambulance Division. Medical aspects have been examined and approved by a panel of medical experts acting as medical advisers to the Division. The Standards shall be kept under constant review by the Divisional Committee to ensure that they continue to reflect current medical and aviation requirements.

## **5. AIRCRAFT OPERATIONAL CATEGORIES (PATIENT CARE REQUIREMENTS)**

The Air Rescue/Air Ambulance Division Committee considers that an AS 350 (Squirrel), or helicopter of equivalent size and performance, is the minimum helicopter suitable for use as an air ambulance, and also considers that single engine piston powered fixed wing aeroplanes are generally not suitable for air ambulance operations.

### **FWA(p) PRESSURISED IFR-CAPABLE INTENSIVE CARE FIXED WING AIR AMBULANCE (IFR/VFR)**

An “Intensive Care Air Ambulance” used to transport patients who may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

### **FWA(n) NON-PRESSURISED IFR-CAPABLE INTENSIVE CARE FIXED WING AIR AMBULANCE (IFR/VFR)**

An “Intensive Care Air Ambulance” used to transport patients who may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

### **FWB STRETCHER CARE FIXED WING AIR AMBULANCE (IFR/VFR)**

A “Stretcher Care Air Ambulance” shall be used to transport patients needing to be transferred on a stretcher and needing some medical attention, but not intensive care during flight. Some monitoring might be required. The patient would usually be transferring from one hospital to another.

### **FW1 SEARCH AND RESCUE FIXED WING AIRCRAFT (IFR/VFR)**

A fixed wing search and rescue aircraft capable of operating up to 500nm offshore for 5.5 hours suitably equipped with navigation, communications and search capabilities, life rafts carried and all on board wearing life jackets and survival suits

### **FW2 SEARCH FIXED WING AIRCRAFT (VFR)**

A fixed wing search aircraft suitably equipped for flight over water in excess of CAA requirements e.g. life raft carried and all on board wearing lifejackets

### **RWA INTENSIVE CARE AIR AMBULANCE MULTI ENGINE HELICOPTER IFR CAPABLE (IFR/VFR)**

An “Intensive Care Air Ambulance” used to transport patients who may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

**RWB INTENSIVE AIR AMBULANCE SINGLE OR TWIN ENGINE HELICOPTER VFR OPERATED ONLY**

An “Intensive Care Air Ambulance” used to transport patients who may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

**RWC RAPID RESPONSE AIR AMBULANCE SINGLE OR MULTI ENGINE HELICOPTER (IFR/VFR)**

A rapid response air ambulance capable of transporting patients from accident or remote sites over difficult terrain to definitive medical care in shortest time possible

**RW1 A SEARCH AND RESCUE HELICOPTER CAPABLE OF OPERATING UP TO 100NM OFFSHORE (IFR/VFR)**

A rotary wing aircraft capable of operating up to 100nm offshore equipped with winch and long line as required for mission.

**RW2 A SEARCH AND RESCUE ROTARY WING AIRCRAFT (VFR)**

A Search and Rescue rotary aircraft used under VFR only with minimal medical and patient focussed equipment, with winch and long line as applicable for mission.

## 6. ABBREVIATIONS USED IN APPENDICES

AA	Air Ambulance
ACC	Accident Rehabilitation and Compensation Insurance Corporation.
ADF	Automatic Direction Finder
AED	Automated External Defibrillator
AH	Artificial Horizon
AMC	Air Medical Crew
AR/AA	Air Rescue/Air Ambulance
ATC	Air Traffic Control
ATO	Air Transport Operations
CAA	Civil Aviation Authority
CARs	Civil Aviation Rules
CO <sub>2</sub>	Carbon Dioxide
DF	Direction Finder
DI	Directional Indicator
DHB	District Health Board
DME	Distance Measuring Equipment
EGPWS	Enhanced Ground Proximity Warning System
EPIRB	Emergency Position Indicator Radio Beacon
ET	Endotracheal
FLWOP	Forced Landing Without Power
GPS	Global Positioning System
HSI	Horizontal Situation Indicator
IAW	In Accordance With
IFR	Instrument Flight Rules
IHT	Inter Hospital Transfer
IMC	Instrument Meteorological Conditions
I/R	Instrument Rating
IV	Intravenous
MULTI	Multi-Engined Aircraft
NIBP	Non-Invasive Blood Pressure Monitor
RCCNZ	National Rescue Coordination Centre
Ops	Operations
O <sub>2</sub>	Oxygen
PA	Passenger Address system
PinC	Pilot in Command
Rad Alt	Radar Altimeter
r/t	Receive/transmit
SAR	Search and Rescue
SOP	Standard Operating Procedure
SP	Single Pilot
VFR	Visual Flight Rules
VHF	Very High Frequency
VHF DF	Very High Frequency Direction Finding
VOR	VHF Omni-Directional Radio Range
X/C	Cross Country Navigation

## 7. NOTES - AIR RESCUE/AIR AMBULANCE STANDARDS

The following Notes shall be read in conjunction with the Air Ambulance Operation Standards and Search and Rescue Standards prescribed for each operation category in Annexes A and B.

### NOTES:

- 1 All pilots shall undergo AIA Air Rescue/Air Ambulance pilot training courses as prescribed in Annex D (Fixed Wing) and Annex E (Helicopter).
- 2 All medical crew should complete an attendant training course which at least covers the elements prescribed in Annex F. The suggested training course contains the procedures that are considered necessary for medical crew involved in aeromedical transfer of patients in New Zealand. Wherever possible, the minimum crew should be an NZFNA Certified Flight Nurse or Flight Nurse with an equivalent qualification should be used for IHT missions. A level 6 NZRC (New Zealand Resuscitation Council) qualification is also required.
- 3 Part of the registration details for each aircraft should include the maximum safe number of patients that can be carried in each of Categories. A factor in determining this number is that, for reasons of safety, the allocated medical crew should be able to keep their safety harness fastened while having immediate and easy access to their patient's head and upper body. No patient in any of these categories should ever be located such that head and upper body are accessible only to the pilot. In Category FWA and RWA air ambulance operations both allocated medical crew should have access to the same patient.
- 4 In Category RWA and RWB air ambulance operations it must be possible to gain access from adjacent the patient's head, for intubation and airway management, without compromising CAA requirements for restraint of the stretcher. It is recognised that in certain aircraft in this an unusual event, the medical crew may have to decide to be unrestrained (if the circumstances permit this with safety) in order to gain suitable access.
- 5 Medical equipment suitable for use in aircraft (lightweight, compact with dry batteries) may be supplied by the DHB or the operator as agreed.
- 6 Bag/Mask Resuscitator: Self-inflating, hand ventilating assembly with PEEP valve available.
- 7 When oxygen is supplied, there must be a pressure gauge and flow meter visible to the attendant, and sufficient oxygen for the flight plus a suitable margin for delays. As a contingency against failures there must be suitable duplication of delivery systems.
- 8 The term 'climate control' in these standards means that a satisfactory ambient temperature can be maintained.

- 9 The PinC, or the senior medical crew, may deviate from these Air Rescue/Air Ambulance Standards when an emergency situation requires immediate action to save life or otherwise protect a patient from further danger.
- 10 When an operator wishes to make a variation to these standards (except under an emergency situation) the variation in the form of an amendment to the Operators Procedures Manual shall be submitted to AIA Air Rescue/Air Ambulance Division for assessment against the relevant standard.
11. An operator Accredited to these standards may use an aircraft that has not been audited by AIA if, for any reason an accredited aircraft is unserviceable or unavailable due to maintenance requirements, or the operator is employed to carry out additional work when an accredited aircraft is not available. It is the operator's responsibility to ensure that the aircraft used is suitable for the air ambulance operation undertaken, and as a minimum, the aircraft must be certified for Air Transport Operations. If the requirement for an additional aircraft is expected to exceed a period of 90 days, the operator must submit an audit application with AIA to have the additional aircraft audited to the appropriate Air Rescue Air Ambulance category.
12. An operator is permitted to use a pilot with 750 hours total time as Pilot in Command under the following conditions;
  - (a) Be under supervision of an experienced Air Ambulance Chief Pilot either in person or by telephone
  - (b) Limited to weather conditions prescribed by the Chief Pilot above.
13. A Pulse Oximeter shall be used whenever oxygen is being administered to the patient.
14. Fully Automated External Defibrillators (AED) are not suitable for helicopter or smaller FW air ambulance operations. An AED with manual function or fully manual device is appropriate. The use of adhesive remote defibrillator pads as apposed to hand held paddles are preferable in an aircraft.
15. Capnography should be used for all ventilated transfers to help ensure adequate ventilation, tube placement and as an added disconnection detection aid.
- 16 Any aircraft acting as an air ambulance is commanded by the Pilot in Command (PIC), all medical personnel are a part of the crew so are carried under the command of the PIC for all aviation and matters of safety. Medical crew will be assigned to the individual mission by the Clinician responsible for dispatching the aircraft in line with the protocols and authority under which they operate.

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## Annex A1

### FIXED WING AIRCRAFT: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANTS (NOTE 2 & 9)	PILOTS (NOTES 1, 9 & 12)
<p><b>Cat: FWA(p)</b></p> <p><b>PRESSURISED IFR CAPABLE INTENSIVE CARE FIXED WING AIR AMBULANCE</b></p> <p><b>(NOTE 3, 4, 10 &amp; 11)</b></p>	<p>Standard multi engine ATO IFR equipped aircraft the operation of which is certificated under CAA rule Part 119</p> <p>plus 1x GPS moving map with terrain warning information, for example units such as MX20 or Garmin 296 or 1x EGPWS ( by December 2007)</p> <p>1 x Mobile phone (hands free) available to both aircrew &amp; AMC. At least 0.8cu m stowage space for equipment, luggage etc</p> <p>.</p> <p>1 x Intercrew Communication. 1 x Stretcher . 1 x Medical securing system or rack.. 1 x Power Supply CAA approved (12v/240v) as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment. 2 x Overhead hooks. 2 x Attendant seats (with one seat adjacent the patient's head). 1 x Torch for each crew person. Climate control &amp; lighting in patient/attendant areas (NOTE 8).</p> <p>Restraints and fittings for all equipment carried;</p>	<p>Vital signs monitors: Electrocardiograph Pulse oximeter (NOTE 13) Blood pressure (Automatic NIBP) Invasive BP capability available Temp monitor (electronic) Defibrillator.(NOTE 14) Suction equipment of an appropriate standard. Bag/mask resuscitator (NOTE 6). Oxygen with delivery equipment (NOTE 7)</p> <p>Suitably equipped medical kit including at least: IV Fluids &amp; giving set IV Pressure bag Laryngoscope blades &amp; suitable ET tubes</p> <p>Pleural drainage equipment.</p> <p>Cricothyroidotomy set. Medication &amp; delivery equipment appropriate for the patient.</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Transport ventilator with disconnect and high pressure alarm</li> <li>• Syringe pump(s)</li> <li>• Neonatal drugs and equipment</li> <li>• Neonatal Incubator and oxygen (NOTE 7)</li> <li>• Incubator monitoring equipment</li> <li>• Stretcher</li> <li>• Capnograph</li> </ul>	<p><b>1-2:</b> Consultant or Registrar in Anaesthetics, Intensive Care, Emergency Medicine or Paediatrics (Neonatal Transfers),</p> <p>and/or</p> <p>Flight Nurse skilled in the type of transfer, e.g. ICU Emergency Medicines or Neonatal Paediatrics.</p> <p>and/or</p> <p>EMST/PRIME qualified GP or Paramedic.</p>	<p>1 x 1000 hr. SP-IFR rated,</p> <p>or</p> <p>1 x 1000 hr pilot plus, 1 x 500 hr pilot.</p> <p>The PinC must have as a minimum: 100 hrs IFR 50 hrs IMC 50 hrs multi 100 hrs PinC X/C 20 hrs night time</p> <p>Pilot induction course to include direct and indirect supervision</p>



## Annex A2

### FIXED WING AIRCRAFT: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANTS (NOTE 2 & 9)	PILOTS (NOTES 1, 9 & 12)
<p><b>Cat: FWA (n).</b></p> <p><b>NON PRESSURISED IFR CAPABLE INTENSIVE CARE FIXED WING AIR AMBULANCE</b></p> <p><b>(NOTE 3, 4, 10 &amp; 11)</b></p>	<p>Standard multi engine or single engine turbine ATO IFR equipped aircraft the operation of which is certificated under CAA rule Part 119</p> <p>plus</p> <p>1x GPS moving map with terrain warning information, for example units such as MX20 or Garmin 296 or 1x EGPWS ( by December 2007)</p> <p>1 x Mobile phone (hands free) available to both aircrew &amp; AMC. At least 0.8cu m stowage space for equipment, luggage etc</p> <p>1 x Mobile phone (hands free) available to both aircrew &amp; AMC. At least 0.8cu m stowage space for equipment, luggage etc</p> <p>1 x Inter crew Communication.</p> <p>1 x Stretcher.</p> <p>1 x Medical securing system or rack..</p> <p>1 x Power Supply CAA approved (12v/240v) as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment.</p> <p>2 x Overhead hooks.</p> <p>2 x Attendant seats (with one seat adjacent the patient's head).</p> <p>1 x Torch for each crew person.</p> <p>Climate control &amp; lighting in patient/attendant areas (NOTE 8).</p> <p>Restraints and fittings for all equipment carried;</p>	<p>Vital signs monitors:</p> <p>Electrocardiograph</p> <p>Pulse oximeter (NOTE 13)</p> <p>Blood pressure (Automatic NIBP)</p> <p>Invasive BP capability available</p> <p>Temp monitor (electronic)</p> <p>Defibrillator.(NOTE 14)</p> <p>Suction equipment of an appropriate standard.</p> <p>Bag/mask resuscitator (NOTE 6).</p> <p>Oxygen with delivery equipment (NOTE 7)</p> <p>Suitably equipped medical kit including at least:</p> <p>IV Fluids &amp; giving set</p> <p>IV Pressure bag</p> <p>Laryngoscope blades &amp; suitable ET tubes</p> <p>Pleural drainage equipment.</p> <p>Cricothyroidotomy set.</p> <p>Medication &amp; delivery equipment appropriate for the patient.</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Transport ventilator with disconnect and high pressure alarm</li> <li>• Syringe pump(s)</li> <li>• Neonatal drugs and equipment</li> <li>• Neonatal Incubator and oxygen (NOTE 7)</li> <li>• Incubator monitoring equipment</li> <li>• Stretcher</li> <li>• Capnograph</li> </ul>	<p><u>1-2</u>: Consultant or Registrar in Anaesthetics, Intensive Care, Emergency Medicine or Paediatrics (Neonatal Transfers),</p> <p>and/or</p> <p>Flight Nurse skilled in the type of transfer, eg ICU Emergency Medicines or Neonatal Paediatrics.</p> <p>and/or</p> <p>EMST/PRIME qualified GP or Paramedic.</p>	<p>1 x 1000 hr. SP-IFR rated,</p> <p>or</p> <p>1 x 1000 hr pilot plus, 1 x pilot with CPL.</p> <p>The P in C must have as a minimum:</p> <p>100 hrs IFR 50 hrs IMC 50 hrs multi 100 hrs PinC X/C 20 hrs night time</p> <p>Pilot induction course to include direct and indirect supervision</p>

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## Annex A3

### FIXED WING AIRCRAFT: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANT (NOTE 2 & 9)	PILOTS (NOTES 1, 9 & 12)
<p><b>Cat: FWB.</b></p> <p><b>STRETCHER CARE FIXED WING AIR AMBULANCE</b></p> <p><b>(NOTE 3, 10 &amp; 11)</b></p>	<p><b>For IFR ops:</b></p> <p>Standard multi engine or single engine turbine ATO IFR equipped aircraft the operation of which is certificated under CAA rule Part 119 plus 1x GPS moving map with terrain warning information for example units such as MX20 or Garmin 296 or 1x EGPWS ( by December 2007)</p> <p><b>For VFR ops:</b></p> <p>Standard VFR ATO instruments and operation certificated under CAA rule Part 119 for night and day VFR plus:</p> <p>1 x GPS</p> <p><b>IFR and VFR ops</b></p> <p>1 x Mobile phone (hands free) available to both aircrew &amp; AMC.</p> <p>At least 0.8cu m stowage space for equipment, luggage etc</p> <p>1 x Inter crew Communication.</p> <p>1 x Stretcher.</p> <p>1 x Medical securing system or rack..</p> <p>1 x Power Supply CAA approved (12v/240v) as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment.</p> <p>2 x Overhead hooks.</p> <p>2 x Attendant seats (with one seat adjacent the patient's head).</p> <p>1 x Torch for each crew person.</p> <p>Climate control &amp; lighting in patient/attendant areas (NOTE 8).</p> <p>Restraints and fittings for all equipment carried;</p>	<p>Oxygen and delivery equipment (NOTE 7).</p> <p>Pulse oximeter</p> <p>ECG</p> <p>Drugs and delivery equipment.</p> <p>Suction equipment of an appropriate standard.</p> <p>Blood pressure monitor, Non-invasive.</p> <p>Suitable medical kit.</p> <p>Airsickness facilities.</p> <p>Defibrillator.(NOTE 14)</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Syringe pump(s)</li> <li>• Stretcher</li> </ul>	<p><u>1-2</u>: Doctor and/or Paramedic/ICO and/or Flight Nurse and/or EMST/PRIME qualified GP.</p>	<p><b>For IFR Ops:</b></p> <p>1 x 750 hr. SP-IFR rated,</p> <p>or</p> <p>1 x 750 hr pilot plus, 1 x 500 hr pilot.</p> <p>The P in C must have as a minimum:</p> <p>100 hrs IFR 50 hrs IMC 50 hrs multi 100 hrs PinC X/C 20 hrs night time</p> <p>Pilot induction course to include direct and indirect supervision</p> <p>.</p> <p><b>For VFR Ops:</b></p> <p>1 x 1000 hr VFR pilot with 100 hrs VFR X/C.</p> <p>Pilot induction course to include direct and indirect supervision.</p>

## Annex A4

### FIXED WING AIRCRAFT: SEARCH AND RESCUE STANDARDS

CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)*	ATTENDANT (NOTE 2)*	PILOTS (NOTES 1 & 9)
<p><b>Cat: FWL.</b></p> <p><b>SEARCH &amp; RESCUE FIXED WING AIRCRAFT</b></p> <p><b>VFR or IFR</b></p> <p><b>CAPABLE OF OPERATING UP TO 500NM OFFSHORE WITH 5.5 HOURS OF SEARCH TIME</b></p> <p><b>(NOTE 10 &amp; 11)</b></p>	<p><b>For IFR ops:</b></p> <p>Standard multi engine or single engine turbine ATO IFR equipped aircraft the operation of which is certificated under CAA rule Part 119</p> <p>plus</p> <p>1x GPS moving map with terrain warning information, for example units such as MX20 or Garmin 296 when available and viable with data link to RCCNZ</p> <p>or</p> <p>1x EGPWS ( by December 2007)</p> <p>VHF Direction Finding Equipment</p> <p><b>For VFR ops:</b></p> <p>Standard VFR ATO instruments and operation certificated under CAA rule Part 119 for night and day VFR</p> <p>plus:</p> <p>1 x GPS</p> <p><b>IFR and VFR</b></p> <p>1 x Mobile phone (hands free).</p> <p>Inter crew communication.</p> <p>VHF Direction Finder.</p> <p>Radar Altimeter</p> <p>2 x observer seats.</p> <p>Life rafts &amp; jackets over water.</p> <p>Radio for communication with Police and RCCNZ, HF radio or satellite telephone.</p> <p>Marine radio</p> <p>Marker flares and dyes.</p> <p>Door modified to enable floatation and communication equipment to be deployed in flight</p> <p>2 x Drop raft, includes radio, EPIRB and rations</p> <p>Radar suitable for detecting vessels and objects in the water</p>	<p>Aircraft First Aid Kit.</p>	<p>2 observers (minimum).</p>	<p>1 x 750 hr. SP-IFR rated,</p> <p>or</p> <p>1 x 750 hr pilot plus, 1 x 200 hr pilot.</p> <p>The PinC must have as a minimum:</p> <p>100 hrs IFR 50 hrs IMC 50 hrs multi 100 hrs PinC X/C 20 hrs night time</p> <p>Trained knowledge of electronic and visual search techniques in particular DF activity.</p>

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## Annex 5

### FIXED WING AIRCRAFT: SEARCH AND RESCUE STANDARDS

<b>CATEGORY</b>	<b>AIRCRAFT EQUIPMENT</b>	<b>MEDICAL EQUIPMENT (NOTE 5)</b>	<b>ATTENDANT (NOTE 2)</b>	<b>PILOTS (NOTES 1 &amp; 9)</b>
<b>Cat: FW2.</b>	Standard day & night VFR instrumentation	Aircraft First Aid Kit.	1 x observer (minimum).	1 x 300 hr pilot.
<b>SEARCH FIXED WING AIRCRAFT</b>	1 x GPS.			Pre briefed and trained knowledge of visual search techniques.
<b>VFR only</b>	VHF Direction Finding Equipment			
<b>(NOTE 10 &amp; 11)</b>	VHF Aeronautical radio.			
	1 Mobile phone (hands free). Inter crew communication.			
	1 x observer seat. Life jackets over water. Life Rafts			

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## Annex B1

### HELICOPTER: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANTS (NOTE 2 & 9)	PILOTS (NOTES 1, 9 & 12)
<p><b>Cat: RWA.</b></p> <p><b>II INTENSIVE CARE AIR AMBULANCE MULTI ENGINE HELICOPTER IFR CAPABLE</b></p> <p><b>(NOTE 3, 4, 10 &amp; 11)</b></p>	<p>Standard multi engine ATO IFR equipped aircraft the operation of which is certificated under CAA rule Part 119</p> <p>plus</p> <p>1x GPS moving map with terrain warning information for example units such as MX20 or Garmin 296 or 1x EGPWS (by December 2006)</p> <p>2 x AH</p> <p>1 x HSI</p> <p>Radar altimeter with pilot programmable warning bug</p> <p><u>See Annex C for additional VFR night requirements</u></p> <p><b>IFR and VFR</b></p> <p>1 x Inter crew communication system.</p> <p>1 x Stretcher.</p> <p>1 x Medical equipment securing system or rack.</p> <p>1 x Power Supply CAA approved (12v/240v) as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment.</p> <p>2 x Overhead hooks. (minimum)</p> <p>2 x Attendant seats (with one seat adjacent the patient's head).</p> <p>1 x Torch for each crew person.</p> <p>Climate control &amp; lighting in patient/attendant areas (NOTE 8).</p> <p>Approved Restraints and fittings for all equipment carried;</p> <p>NVG compatible cabin lighting</p>	<p>Vital signs monitors:</p> <p>Electrocardiograph</p> <p>Pulse oximeter (NOTE 13)</p> <p>Blood pressure (Automatic NIBP)</p> <p>Invasive BP capability available</p> <p>Temp monitor (electronic)</p> <p>Defibrillator. (NOTE 14)</p> <p>Suction equipment of an appropriate standard.</p> <p>Bag/mask resuscitator (NOTE 6).</p> <p>Oxygen with delivery equipment (NOTE 7)</p> <p>Suitably equipped medical kit including at least:</p> <p>IV Fluids &amp; giving set</p> <p>IV Pressure bag</p> <p>Laryngoscope blades &amp; suitable ET tubes</p> <p>Pleural drainage equipment.</p> <p>Cricothyroidotomy set.</p> <p>Medication &amp; delivery equipment appropriate for the patient.</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Transport ventilator with disconnect and high pressure alarm</li> <li>• Syringe pump(s)</li> <li>• Neonatal drugs and equipment</li> <li>• Neonatal Incubator and oxygen (NOTE 7)</li> <li>• Incubator monitoring equipment</li> <li>• Stretcher</li> <li>• Capnograph (NOTE 15)</li> </ul>	<p><u>1-2</u>: Consultant or Registrar in Anaesthetics, Intensive Care, Emergency Medicine or Paediatrics (Neonatal Transfers),</p> <p>and/or</p> <p>Flight Nurse skilled in the type of transfer, eg ICU Emergency Medicines or Neonatal Paediatrics.</p> <p>and/or</p> <p>EMST/PRIME qualified GP or Paramedic.</p>	<p>1 x 2000 hr pilot,</p> <p>or</p> <p>1 x 1500 hr pilot plus, 1 x 500 hr pilot.</p> <p>All with:</p> <p>15 hrs X/C night VFR/IFR with appropriate VFR night X/C rating where night operations are undertaken.</p> <p><b>Minimum for IFR Ops:</b></p> <p>75 hrs IFR</p> <p>30 hrs IMC</p> <p>20 hrs multi</p> <p>100 hrs PinC X/C</p> <p>50% of a pilots fixed wing flight or logged simulator time may be credited towards the above totals to a maximum of 50% of the helicopter requirements.</p>

B1

## Annex B2

### HELICOPTER: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANTS (NOTE 2 & 9)	PILOTS (NOTES 1, 9& 12)
<p><b>Cat: RWB.</b></p> <p><b>INTENSIVE CARE AIR AMBULANCE HELICOPTER VFR</b> <b>(NOTES 3, 4, 10 &amp; 11)</b></p>	<p>Standard single or twin engine ATO VFR equipped aircraft the operation of which is certificated under CAA rule Part 119</p> <p>plus 1x GPS moving map with terrain warning information for example units such as MX20 or Garmin 296</p> <p><b>For VFR night Ops:</b> 2 x AH 1 x HSI 1 x ADF or GPS Radar altimeter with pilot programmable warning bug <u>See Annex C for additional VFR night requirements</u></p> <p><b>VFR:</b> 1 x Inter crew communication system. 1 x Stretcher. 1 x Medical equipment securing system or rack. 1 x Power Supply (12v/240v) CAA approved as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment. 2 x Overhead hooks. 2 x Attendant seats (with one seat adjacent the patient's head). 1 x Torch for each crew person. Climate control &amp; lighting in patient/attendant areas (NOTE 8). Restraints and fittings for all equipment carried;</p>	<p>Vital signs monitors: Electrocardiograph Pulse oximeter (NOTE 13) Blood pressure (Automatic NIBP) Invasive BP capability available Temp monitor (electronic) Defibrillator. (NOTE 14) Suction equipment of an appropriate standard. Bag/mask resuscitator (NOTE 6). Oxygen with delivery equipment (NOTE 7)</p> <p>Suitably equipped medical kit including at least: IV Fluids &amp; giving set IV Pressure bag Laryngoscope blades &amp; suitable ET tubes Pleural drainage equipment.</p> <p>Cricothyroidotomy set. Medication &amp; delivery equipment appropriate for the patient.</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Transport ventilator with disconnect and high pressure alarm</li> <li>• Syringe pump(s)</li> <li>• Neonatal drugs and equipment</li> <li>• Neonatal Incubator and oxygen (NOTE 7)</li> <li>• Incubator monitoring equipment</li> <li>• Stretcher</li> <li>• Capnograph (NOTE 15)</li> </ul>	<p>1-2: Consultant or Registrar in Anaesthetics, Intensive Care, Emergency Medicine or Paediatrics (Neonatal Transfers), and/or Flight Nurse skilled in the type of transfer, eg ICU Emergency Medicines or Neonatal Paediatrics. and/or EMST/PRIME qualified GP or Paramedic.</p>	<p>1 x 2000 hr pilot, or 1 x 1500 hr pilot plus, 1 x 500 hr pilot.</p> <p>All with: 15 hrs X/C night VFR/IFR with appropriate VFR night X/C rating where night operations are undertaken.</p> <p>Mountain flying experience if operating in mountainous terrain.</p> <p>50% of a pilots fixed wing flight or logged simulator time may be credited towards the above totals to a maximum of 50% of the helicopter requirements.</p>

B2

## Annex B3

### HELICOPTER: AIR AMBULANCE OPERATION STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTE 5)	ATTENDANT (NOTE 2 & 9)	PILOTS (NOTES 1, 9 & 12)
<p><b>Cat: RWC.</b></p> <p><b>RAPID RESPONSE AIR AMBULANCE SINGLE OR MULTI ENGINE HELICOPTER IFR or VFR</b> <b>(NOTE 3, 10 &amp; 11)</b></p>	<p>Standard multi/single engine ATO IFR or VFR equipped aircraft the operation of which is certificated under CAA rule Part 119plus</p> <p>1x GPS moving map with terrain warning information for example units such as MX20 or Garmin 296 or 1x EGPWS (by December 2006 for IFR operations only)</p> <p><b>For VFR night Ops:</b> Standard VFR ATO instruments and operation certificated under CAA rule Part 119 for night and day VFR plus: 2 x AH 1 x HIS Radar altimeter with pilot programmable warning bug <u>See Annex C for additional VFR night requirements</u> <b>IFR and VFR</b> 1 x Intercrew communication system. 1 x Stretcher. 1 x Medical equipment securing system or rack. 1 x Power Supply (12v/240v) CAA approved as appropriate with leads &amp; adapters for monitors, incubator, defibrillator and any other medical equipment. 2 x Overhead hooks. 2 x Attendant seats (with one seat adjacent the patient's head). 1 x Torch for each crew person. Climate control &amp; lighting in patient/attendant areas (NOTE 8). Restraints and fittings for all equipment carried;</p>	<p>Oxygen and delivery equipment (NOTE 7).</p> <p>Pulse oximeter</p> <p>ECG</p> <p>Drugs and delivery equipment.</p> <p>Suction equipment of an appropriate standard.</p> <p>Blood pressure monitor, Non-invasive.</p> <p>Suitable medical kit.</p> <p>Airsickness facilities.</p> <p>Defibrillator. (NOTE 14)</p> <p><b>AS REQUIRED:</b></p> <ul style="list-style-type: none"> <li>• Syringe pump(s)</li> <li>• Stretcher</li> </ul>	<p><u>1-2</u>: Doctor and/or Paramedic/ICO and/or Flight Nurse and/or EMST/PRIME qualified GP.</p>	<p>1 x 2000 hr pilot,</p> <p>or</p> <p>1 x 1500 hr pilot plus, 1 x 500 hr pilot.</p> <p>All with: 15 hrs X/C night VFR/IFR with appropriate VFR night X/C rating where night operations are undertaken.</p> <p><b>Minimum for IFR Ops:</b> 75 hrs IFR 30 hrs IMC 20 hrs multi 100 hrs PinC X/C</p> <p>Mountain flying experience if operating in mountainous terrain.</p> <p>50% of a pilots fixed wing flight or logged simulator time may be credited towards the above totals to a maximum of 50% of the helicopter requirements 1 x 1500 hr pilot,</p>

B3

## Annex B4

### HELICOPTER: SEARCH AND RESCUE STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTES 5)*	ATTENDANT (NOTE 2)*	PILOTS (NOTES 1 & 9)
<p><b>Cat: RW1.</b></p> <p><b>SEARCH &amp; RESCUE HELICOPTER VFR or IFR UP TO 100NM OFFSHORE (NOTE 10 &amp; 11)</b></p>	<p>Standard multi single engine ATO IFR or VFR equipped aircraft the operation of which is certificated under CAA rule Part 119 plus</p> <p>1x GPS moving map with terrain warning information for example units such as MX20 or Garmin 296 or 1x EGPWS (by December 2006 for IFR operations only)</p> <p><b>For VFR night Ops:</b> Standard VFR ATO instruments and operation certificated under CAA rule Part 119 for night and day VFR plus: 2 x AH 1 x HSI Radar altimeter with pilot programmable bug. <u>See Annex C for additional VFR night requirements</u></p> <p><b>IFR and VFR</b> VHF DF. 1 x Mobile phone (hands free). Winch, or tested steel core or chain long line as required in Part 133. Winch belts, strops, harnesses. Stretcher suitable for external recovery or scoop net. Nite Sun or other approved direction controllable external light. Suitable device for communicating with police and RCCNZ. Ambulance radio. Ground/air portable radios. Protective equipment for crews as appropriate, thermal survival suits, life raft. Marker flares and dyes. Life jackets and harnesses. Aerial drop life rafts &amp; crew raft.</p>	<p>Standard first aid kit (minimum equipment).</p> <p>* Where an intention to rescue is inherent in the tasking instruction, the medical equipment and attendant requirements shall be as prescribed for a Rapid Response Air Ambulance.</p>	<p>Winch crewman and trained observers as appropriate. Records of training and experience for winch and static long line maintained.</p>	<p>1 x 2000 hr pilot, or 1 x 1500 hr pilot plus, 1 x 500 hr pilot.</p> <p>All with: 15 hrs X/C night VFR with appropriate rating, where required for night operations.</p> <p>Mountain flying experience if operating in mountainous terrain.</p> <p>Under slung load and long line experience as required.</p> <p>Min for IFR Ops: 75 hrs IFR 30 hrs IMC 20 hrs multi 100 hrs PinC X/C</p> <p>50% of a pilots fixed wing flight or logged simulator time may be credited towards the above totals to a maximum of 50% of the helicopter requirements 1 x 1500 hr pilot,</p>

B4

## Annex B5

### HELICOPTER: SEARCH AND RESCUE STANDARDS

OPERATION CATEGORY	AIRCRAFT EQUIPMENT	MEDICAL EQUIPMENT (NOTES 5)*	ATTENDANT (NOTE 2)*	PILOTS (NOTES 1 & 9)
<b>Cat: RW2</b>	Standard VFR kit for ATO			
<b>SEARCH HELICOPTER VFR ONLY</b> <b>(Note 10,11 &amp; 17)</b>	For VFR night operations 1 x AH 1 x HSI 1 x ADF or GPS Radar altimeter with pilot programmable bug.  <u>See Annex C for additional VFR night requirements</u>  DF-VHF 1 x mobile telephone (hands free) Life raft and jackets for all on board if over water	Standard first aid kit for aircraft (minimum equipment)	1 x observer or crewman (crewman to be trained in static line and winch operations as applicable and currency and competency records maintained)	1 x 1000 hour pilot 15 hours X/C night VFR with appropriate rating  Mountain flying experience if operating in mountainous terrain  Under slung load and long line experience as required  Pre-briefed or trained in visual search techniques  50% of a pilots fixed wing time may be credited towards the above totals to a maximum of 50% of the helicopter requirement

## **ANNEX C - STANDARD FOR NIGHT VFR OPERATIONS OF HELICOPTERS ENGAGED IN AIR AMBULANCE AND SEARCH AND RESCUE OPERATIONS**

The Aviation Industry Association in relation to all helicopter night VFR air ambulance and search and rescue operations requires the following recommendations and requirements, where the operation involves a flight leg of greater than 25 nautical miles.

Due caution must be exercised at all times, particularly in adverse conditions.  
**Where safety of the crew, passengers or aircraft may be compromised, pilots are required to exercise caution and not undertake the operation.**

### **1. DEFINITIONS:**

In this document, the following terms have the following meanings, which are consistent with standards imposed by the International Civil Aviation Organisation:  
**Recommendations** – Recommendations are discretionary. They are recognised as desirable standards of practice in the interests of safety, regularity or efficiency. Pilots should endeavour to conform to recommendations.

**Requirements** – Requirements are mandatory directives, necessary for the safety and regulation of aviation. All pilots and operators must conform to requirements

The terms “**recommended**” and “**required**” have corresponding meanings.

### **2. WEATHER:**

2.1 Visibility – It is a requirement that all pilots undertaking VFR night flying operations maintain a minimum visibility of 8 kilometres at all times.

2.2 Cloud – It is a requirement that no helicopter undertake VFR night flying operations where cloud base is lower than the minimum of 2000 feet in uncontrolled airspace and 1500 feet in controlled airspace, provided that:

If it is necessary to undertake a VFR night flying operation in order to preserve life; and the cloud base is below the aforementioned minima, the pilot-in-command is required to immediately inform the relevant Air traffic Control tower of the action and immediately notify the Director of the Civil Aviation Authority and file a Section 13A report if requested to do so by the Director.

It is recommended that no VFR night flying operations are undertaken where cloud base is below the minimum of 1000 feet, above the terrain over which the helicopter is travelling.

### 3. EQUIPMENT:

It is a requirement that the helicopter is equipped with the following:

- 3.1 A radar altimeter.
- 3.2 A second artificial horizon.
- 3.3 A Nitesun or pilot directionally controlled floodlight for use in landing.

It is recommended that a Nitesun or pilot directionally controlled floodlighting be used for designated landing sites that are lit by permanent lights, or where night vision goggles are used.

It is a requirement that a Nitesun or pilot directionally controlled floodlighting is used for landing at unprepared locations.

- 3.4 At least one of the following:
  - (i) Autopilot – capable of holding attitude and heading; or
  - (ii) A crew of two pilots (or crewmen trained to an acceptable standard). The non-flying crew must have access to the radio, and GPS, be able to sight the flight instruments and communicate with Air Traffic Control to obtain clearances; and assist the flying pilot with radio work and overseeing the approach, ensuring heading and altitudes are correctly followed; or
  - (iii) The pilot being equipped with a minimum of “Generation 3” aviation approved night vision goggles. For effective performance of the night vision goggles, the cockpit must be capable of being darkened to the extent that there is no internal or external aircraft light to degrade the performance of the goggles and lighting must have night vision goggle filters or be floodlit with night vision goggle compatible cockpit lighting.

**If night vision goggles are utilised, pilots are required to receive training to remain current.**

### 4. OPERATIONS:

- 4.1 En-route – It is a recommendation that all VFR flights at night are conducted by climbing to the minimum safe altitude, as depicted on the radio navigation chart or company en-route guide, or a minimum of 1000 feet above the en-route terrain including 5 nm each side of the track; and that all VFR night flights are clear of cloud; provided however

**If a helicopter is adequately equipped with instruments and approved and the pilot is trained and current to IFR standards that pilot may use his/her discretion as to conducting the flight under IFR.**

- 4.2 Approach – It is a requirement that the pilot of a VFR night flight may only descend below the minimum safe altitude to an established helipad, illuminated by permanently fixed lights or ground lighting provided by ground vehicles if the helipad is visible to the pilot.

It is a requirement that with all approaches, the aircraft be flown so that the aircraft remains clear of any obstructions to allow a safe arrival at the designated landing area.

It is a requirement that flights into unprepared landing areas are only permitted where the helicopter is fitted with a Nitesun or other pilot controlled flood lighting.

It is recommended that on approach into unprepared areas, the pilot is in direct communication with appropriately trained personnel, such as the Fire Service, Police or Ambulance crew. All personnel must be briefed and understand the implications of overhead wires, loose objects on the ground and wind; provided however that the use of night vision goggles by the flying pilot into an unprepared landing area are acceptable alternative.

- 4.3 Departure – All night departures are required to be undertaken over a flight path that ensures the helicopter will remain clear of any obstructions during the climb to cruise altitude. The pilot is required to be capable of transition safely from visual reference, to outside lighting, to flight by reference to the aircraft instruments if necessary.
- 4.4 Inadvertent IMC (Instrument Meteorological Conditions) – All flight crew are required to be familiar with the procedures that should be adopted in the event of inadvertent IMC conditions being experienced. Each operator is required to adopt and implement procedures, dependent on the equipment contained in the helicopter, and on the experience of the flight crew.

It is recommended that the pilot flying the helicopter hold at least a Fixed Wing Instrument Rating.

- 4.5 Pilots Experience – The pilot in command is required:

- to have a minimum of 2000 hours helicopter time
- to hold a night rating
- to have completed 15 hours of night cross country time
- where a two pilot crew is used, the second pilot need only hold a commercial pilots license.
- to have undergone sufficient on-the-job line and route training to allow them to be familiar with the departure, en-route and approach to all landing areas in their area of operation, including unprepared landing areas.

- for flight beyond 5 nm from a lighted aerodrome or heliport, the pilot in command is to have completed at least one hour of instrument flying recently in the previous 90 days (61.207 refers).

4.6 Crew Composition – Where a crewman is being used in a single pilot operation at night, it is recommended the crewman be trained in the use of aviation radios to obtain clearances, GPS and other navigation equipment. This will enable the crewman to enter waypoints, assist the pilot in night operations and consequently reduce the workload on the flying pilot.

The crew person should have reasonable access to the radio and navigation equipment.

4.7 Night Vision Goggles – If night vision goggles are used; flight crew are required to have at least “Generation 3” night vision goggles; and have undergone an appropriate course of training relating to the use of the night vision goggles; and the helicopter interior must be equipped with lighting compatible with night vision goggles.

4.8 Simulator Training – It is recommended that all pilots operating at night undergo six monthly simulator training scenarios that simulate night approaches and departures into prepared and unprepared landing areas and inadvertent IMC conditions to a standard acceptable to the operator, thereby permitting the safe retrieval of IMC situation to operations by visual reference.

## ANNEX D - FIXED WING PILOT TRAINING COURSES

### COURSES:

**Induction Training  
Recurrent Training**

### INDUCTION TRAINING

This training is to be completed by all pilots who join the air ambulance operation of the organisation. It involves:

- (1) **Ab-initio AA Pilots** Fully detailed Induction
- (2) **Experienced AA Pilots** Same as ab-initio pilots except tailored to previous experience. Must cover organisation SOPs.

### AB-INITIO AIR AMBULANCE PILOT INDUCTION

- (1) Record personal and flying details and ensure these meet minimum organisation flight crew standards and AIA AR/AA Standards.
- (2) Carry out an aircraft type rating or rating review on aircraft type so the pilot operates the aircraft in accordance with organisation SOPs.
- (3) Introduce and practice setting up preparing and loading, and unloading aircraft configurations:
  - (a) Stretcher equipment, 2 attendants, stretcher bridge
  - (b) Stretcher, attendant, and relative
  - (c) Incubator, 2 attendants, and relative
  - (d) Wheelchair patient and attendant
  - (e) Sitting patient(s) and attendant
  - (f) Familiarise and practice use of communication system

#### External Communications

- i Equipment - pagers, mobiles, r/t, lists
- ii SOP's - normal and after hours
- iii Contact numbers and names - hospitals, ambulances, taxis, Doctors and refuellers.

#### Onboard Aircraft

- i PA
- ii Intercom
- iii Mobile phone
- iv Radio telephone
- v SOP

- (g) Familiarise and practice checking, maintaining and stowage of air ambulance equipment
  - i At Aerodrome – Oxygen, stretchers, stretcher base, loading ramps, power leads, hooks.
  - ii In Aircraft - same as above
- (h) Routes and Terminals Familiarisation  
Weather, communications, alternate routes, parking, refuelling, altitudes, turbulence, descents, pilot's documentation, protective clothing, oxygen, traction.
- (i) In flight responsibilities and priorities.
- (j) Basic medical knowledge of aviation medicine (altitude, motion sickness, eyes, brain, gases, casts, infection), defibrillator use.
- (k) Medical emergencies, O<sub>2</sub> failure, power failure, incubator failure, aggressive behaviour, defibrillator paddles.
- (l) Introduce to relevant hospital and ambulance personnel.
- (m) Search and Rescue training and responsibilities - callout, electronic and visual search techniques.
- (n) Post flight duties - documentation, aircraft cleaning, equipment configuration, resource replenishment, defects action, hospital reports/documentation.
- (o) Occupational Safety and Health

## REVIEW TRAINING

Carry out every six months in association with six monthly proficiency checks.

- (1) Routes review (cover all main routes once every 12 months)
- (2) Loading/unloading review
- (3) Equipment review
- (4) Medical knowledge review
- (5) Communications review
- (6) Responsibilities - pre-flight, in-flight, and post flight
- (7) Search and rescue technique review

## ANNEX E- HELICOPTER PILOT TRAINING COURSES

### COURSES:

**Induction Training**  
**Recurrent Training**

### INDUCTION TRAINING

This training is to be completed by all pilots who join the air ambulance operation of the organisation. It involves:

- (1) **Ab-initio AA Pilots** Fully detailed Induction
- (2) **Experienced AA Pilots** Same as ab-initio pilots except tailored to previous experience. Must cover organisation SOPs.

### AB-INITIO AIR AMBULANCE PILOT INDUCTION

- (1) Record personnel and flying details and insure these meet minimum organisation flight crew and AIA AR/AA Standards.
- (2) Carry out an aircraft type rating or rating review on aircraft type so the pilot operates the aircraft in accordance with organisation SOPs.
- (3) Introduce and practice setting up, preparing, loading and unloading aircraft configurations.
  - (a) Stretcher equipment, 2 attendants, stretcher bridge
  - (b) Stretcher, attendant, and relative
  - (c) Incubator, 2 attendants and/or a relative
  - (d) Familiarise and practice use of communication systems
  - (e) Fitting rescue and other operational equipment

#### External Communications

- i Equipment - pagers, mobiles, radio lists
- ii SOPs - normal and after hours
- iii Contact numbers and names - hospitals, ambulances, taxis, Doctors, and refuellers.

#### Onboard Aircraft

- i PA
- ii Intercom
- iii Mobile phone
- iv Radios
- v SOP
- vi Safety briefings
- vii GPS/ Moving map

- (f) Familiarise and practice checking, maintaining and stowage of air ambulance equipment
  - i At rescue helipad, preparing helicopter with medical rescue and operational equipment
  - ii In aircraft - same as above
- (g) Routes, terminals and operating area familiarisation.  
Weather, communications, alternate routes, parking re-fuelling, altitudes, descents, pilots documentation, protective clothing.
- (h) In flight responsibilities and priorities.
- (i) Basic medical knowledge of aviation medicine (altitude, motion sickness, eyes, brain, gases, casts, infection), defibrillator use.
- (j) Medical emergencies, oxygen failure, power failure, incubator failure, aggressive behaviour, defibrillator paddles.
- (k) Introduction to relevant hospital and ambulance personnel.
- (l) Search and Rescue training and responsibilities - call-out, electronic and visual search techniques.
- (m) Post flight duties - documentation, aircraft cleaning, medical equipment cleaning, resource replenishment, defects action, hospital reports/documentation, emergency flight regulations notifications.
- (n) Night VFR operations - minimum weather requirements, operational procedures, limitations, use of external lighting.
- (o) Emergency flights under Section 13a of the Civil Aviation Act 1990- Duties of PinC and operator during emergencies.
- (p) Occupational Health and Safety requirements.

## **REVIEW TRAINING**

Carry out every six months. The following

- (1) Routes review - discussion on organisation normal operational routes not flown within the last six months.
- (2) Loading/unloading review.
- (3) Equipment review.
- (4) Medical knowledge review.

- (5) Communications review.
- (6) Responsibilities - pre-flight, in-flight, and post flight.
- (7) Search and rescue technique review.
- (8) Instrument approach if helicopter is equipped for night operations and has appropriate navigational aids.
- (9) Winch, Nitesun and other operational equipment review if fitted and used.
- (10) Emergency flights and night operations criteria review.

The above, other than the instrument flight requirements in (8) above which shall be a flight review, may be conducted using an oral or written exam. The decision as to the need to flight review a pilot on the remaining items shall be at the discretion of individual organisations.

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**ANNEX F**

**SUGGESTED TRAINING**

**FOR**

**MEDICAL ATTENDANTS**

**INVOLVED IN**

**AEROMEDICAL TRANSFER OF PATIENTS**

**IN**

**NEW ZEALAND**

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## AIA SUGGESTED ATTENDANT TRAINING COURSE

### PURPOSE

The aim of this Annex is to provide a standard framework for the development of a training course for AMC's involved in aeromedical transfers.

All staff involved in aeromedical transports are to have formal training. The following recommended training syllabus is designed to address this issue and provide SUGGESTED TRAINING FOR MEDICAL ATTENDANTS INVOLVED IN AEROMEDICAL TRANSFERS IN NEW ZEALAND.

### AIRCRAFT OPERATIONAL CATEGORIES

These have been designed by the AIA on the basis of patient care requirements and are as follows:

A INTENSIVE CARE AIR AMBULANCE (IFR) (Category **FWA, FWB, RWA and RWB**)

An Intensive Care Air Ambulance shall be used to transport patients that may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

**ATTENDANTS: Consultant or Registrar in Anaesthetics, Intensive Care, Emergency Medicine or Paediatrics (neonatal transfers) and/or Resident MO or GP or Flight Nurse skilled in type of transfer, eg ICU, Emergency Medicine or neonatal Paediatrics, etc and/or EMST/PRIME qualified GP or Paramedic.**

B RAPID RESPONSE AIR AMBULANCE (VFR) (Category **RWC**)

A Rapid Response Air Ambulance shall be used to transport patients needing intensive care and/or monitoring prior to initial hospitalisation, and usually needing emplanement at or near the site of an accident soon after its occurrence.

**ATTENDANTS: Doctor and/or EMST/PRIME qualified GP and/or Paramedic/ICO skilled in trauma management and intubation.**

C SEARCH AND RESCUE AIRCRAFT (category **FW1, FW2, RW1 and RW2**)

A Search and Rescue aircraft may be fixed or rotary wing suitably equipped with navigation, communications and rescue capabilities and may include any category of air ambulance.

Note: If there is any intention to rescue, rather than just to search, then the aircraft should also be set up as a Rapid Response Air Ambulance.

### PROPOSED STRUCTURE

The course would involve two modules each of which may require one half day to complete. They need not be both completed on the same day. Consultants and Registrars conducting IHT work with a Certified Flight Nurse would not be required to complete a full two day course; however all of the available Medical team will have to complete a

mandatory two-hour aircraft, safety and equipment familiarisation session before undertaking any missions.

## **MODULE ONE: AIRCRAFT ORIENTATION**

A practical hands on session involving inspection of the aircraft and its equipment plus medical equipment used, i.e. pulse oximeter, portable ventilator, etc. This would be conducted with the local medical adviser and Chief Flying Officer or nominated alternates, under the following headings.

### **AIRCRAFT**

A briefing and familiarisation of the aircraft type, performance and rating is required. Principles of flight, eg stalling, pitch roll and yaw, FLWOP. Instruction on VFR and IFR conditions. Equipment carried on aircraft, VOR/DME/GPS, etc. Circuits in aircraft with equipment, as appropriate.

### **SAFETY**

#### Ground

Hazard identification, approaching a helicopter, safe areas, propellers, carrying of equipment, disembarking, etc.

#### Air

Safety equipment, fire extinguisher, axe, exits, lifejackets, harnesses, sick bags, etc. Scenarios, engine failure, fire sudden decompression, turbulence, survival techniques, door latches.

### **COMMUNICATION**

Knowledge of ATC, headphones, talking to ambulance, pilot, patient both on ground and in air. Knowing when not to talk!

### **STRETCHER LOADING AND TRANSFER**

Familiarisation with stretcher bridge. Thomas pack etc. Be able to confidently load/unload patients in adverse conditions. Secure loose objects such as blankets.

### **EQUIPMENT**

ECG monitor, defibrillator, electrical connection, battery, suction equipment of an appropriate standard, oxygen supply and attachments, drugs, incubators, etc. Attendants should be competent in operating equipment necessary for their level of transfer and able to interface ambulance equipment with aircraft fittings.

Equipment must be securely stowed, compatible with aircraft avionics, backup power and capable of operating under adverse conditions such as vibration, etc. NG tubes (wide bore), venting of colostomies, ET tubes, cuffs filled with water, due to pressure change due to altitude variation. This is one of the fundamental issues in training. Due to the high turnover of medical staff, e.g. Registrars, nursing staff are vital in equipment management and use.

**COMMON PROBLEMS**

Noise and inability to take blood pressure, auscultate chests and hear alarm monitors.  
Limited space for CPR. Difficulty getting IV fluids to run, accessing IVs and injecting drugs in turbulence.

**ADMINISTRATION GUIDELINES**

Priority of mission, the pilot is in absolute command of the aircraft and crew, however the pilot should seek and note appropriate advice to make decisions in the best interest of the patient without compromising flight safety.

Documentation:

- ✎ Liaison with referring or accepting hospital.
- ✎ Detailed record keeping of clinical or other events
- ✎ Patient handover and availability and co-ordination of land transport.
- ✎ Pre flight and in-flight checklist and recordings are vital.
- ✎ Check lists to be specific for category of transfer.
- ✎ Debrief.

**CLINICAL RESPONSIBILITY**

The chain of responsibility must be clear throughout the transfer.  
Responsibility for patient care during transport must be vested in an appropriately qualified medical practitioner. Formal handover from referring doctor to retrieval doctor and from the latter to the hospital doctor is essential.

*Source: Faculty of Intensive Care, Australian and New Zealand College of Anaesthetists and Australasian College for Emergency Medicine, Minimum Standards for Transport of the Critically Ill.*

## MODULE TWO: AVIATION MEDICINE

This would also take one half-day and would be theory orientated. It would be conducted by medical staff nominated by AIA and would be a set curriculum under the following proposed headings.

### 1 EFFECTS OF ALTITUDE

Physiology, and effects of reduced pressure. Trapped gases and expansion at normal sites, abnormal sites and in equipment, eg sinuses, air emboli, intra cranial air, etc. Balloon catheters, ET tubes, ventilators, IV lines. UWSD. Boyles and Daltons Law. Reduced temperature, reduced oxygen tension and hypoxia. Sudden decompression if pressurised aircraft.

### 2 EFFECTS OF AIRCRAFT

G forces, acceleration, turbulence, vibration and noise. Motion sickness, fear of flying, anxiety, panic disorder, effects of confinement under normal and adverse flying conditions. IFR, night flying and adverse weather.

### 3 CONDITIONS AT RISK

#### Head Injuries:

Maintain O<sub>2</sub>, sandbag head (to stabilise and immobilise), beware C-Spine injury. Ventilator settings, intubated, NG tube, urinary catheter, free air in skull, aerocoele, IV line for antibiotics or Mannitol, relaxants, etc. ICP monitoring, if available. Capnography if available.

#### Chest Injuries

Pneumothorax, pneumomediastinum, rib fractures, chest drains. Note the need for reduced rate of descent/climb, and that most chest conditions, including recent or current presence of chest drains will mandate sea level flight. UWSD and Heimlich valve, risk of barotrauma with IPPV.

#### Multiple Trauma

Control haemorrhage, immobilise #, EMST course.

#### Gastrointestinal Problems

Bowel obstruction, colostomies vented, use NG tube.

#### ENT and Eye Trauma

Beware intracranial air, retinal detachment and need for high O<sub>2</sub>, pressurised aircraft.

#### Infection

Sinusitis, pneumonia, HIV and other infectious diseases.

#### Diving Injuries

Decompression sickness, arterial gas embolism, supine, left lateral position. High O<sub>2</sub> and volume support, use of heparin. Fly minimum safe altitude, usually Helicopter low level. Dysbaric (diving related) illness is one of the rare absolute mandatory requirements for avoidance of pressure changes. Helicopters and un-pressurized FW

a/c are equally satisfactory if conventional minimum safe altitude is observed. Otherwise FW pressurized to sea level is mandated.

#### Cardiac Patients

Post MI, arrhythmia. All attendants should have current CPR training (preferably Level 6 NZRC) for all transfers.

#### Spinal Injuries

Convert swinging to fixed/traction, vacuum mattress, beware lack of sensation, risk of burns, injury, etc, as patient unable to identify painful stimulus. Maintain adequate core temperature.

#### Psychiatric Disorders

Restrained, IV access with plenty of tranquillisers and/or neuroleptic. (Note patient must be ventilated and transported by ICU team if paralyzing agents used.) Aircraft and crew safety considerations override any absolute requirement for air transport of the psychiatrically unstable patient.

#### Neurology

Seizures, epilepsy. Need for calming patient and potential restraint in flight, or need to land to address situation, or IV access to facilitate drug administration.

#### Infants/Neonates

Highly specialised and only needs to be taught to staff involved in this type of transfer.

#### Organ Donation

### **SUMMARY**

This is a guideline for each operator/medical adviser to follow. Due to variety of operations, the course will need to be structured to the needs of the organisation, eg ICU nurses do not need to be fully skilled in neonatology if not doing this type of transfer.

The important issue is that there is a formal teaching programme in Aviation Medicine and Aircraft Orientation. If an operator is to be accredited by the AIA on the basis of pilot competence and equipment carried, the organisation providing the medical staff must provide a course as described above. Attendants should have completed a course and preferably completed a dual transfer with a more skilled attendant before going solo.

In addition, medical attendants must be deemed to be clinically competent by the organisations medical adviser, and qualified to provide the level of care determined by the category of transfer. **Medical attendants who have not been in light aircraft, and/or are unfamiliar with equipment, and/or have no training in Aviation Medicine should be deemed UNFIT TO FLY.**

## **ANNEX G - AIR RESCUE/AIR AMBULANCE AUDIT PROCEDURE**

### **1 INTRODUCTION**

- 1.1 In 1995 the Civil Aviation Authority ceased its involvement in determining standards for, and registration of, air ambulances. In a parallel development the Aviation Industry Association formed an Air Rescue/Air Ambulance Division, which has subsequently published national Standards (AR/AA Standards Manual) for air rescue/air ambulance aeroplanes and helicopters. These Standards, once accepted by the sector are sent to ACC, DHB's and MOH for review and endorsement, with particular emphasis on the clinical or attendant standard.
- 1.2 AIA members providing air ambulance services to the ACC, DHB's and MOH, or wishing to do so, will be required among other things, to meet the AIA standards. It is, therefore, in the national interest to have all members of the AIA Air Rescue/Air Ambulance Division complying with the Standards.

### **2 PURPOSE**

- 2.1 The purpose of this Manual is to set out the audit procedures acceptable to AIA for assessing members' compliance with the appropriate Standard and for gaining registration as a quality supplier of air ambulance services.

### **3 AIR RESCUE/AIR AMBULANCE OPERATIONS MANUAL**

- 3.1 Operators applying for registration under the AIA standards shall submit an operations manual for assessment. The operations manual may be submitted either as a paper based document, or in a suitable electronic format, provided that the manual details the means and methods they have adopted for supplying air rescue or air ambulance services to the requirements set out in the AR/AA Standards Manual. This operations manual is an essential element of the audit process.
- 3.2 It is intended that the Operations Manual be part of the Civil Aviation certification requirement, although evidence that the operator holds the appropriate air operator certificate will be sought prior to the audit. The Operations Manual shall be a complete description of the company management structure and operating procedures for the provision of AR/AA services. Specific issues to be addressed in the operations manual are:
  - (1) A statement concerning the scope of AR/AA activity, including objectives, air ambulance category, and the company's commitment to AIA Standards, quality and observance of the requirements of their air operator certificates.
  - (2) A definition of the organisation adopted by the company for the delivery of AR/AA services including the trust board and accountable manager, together with the named person/s responsible for:

- a flight operations,
  - b medical facilities, eg medical equipment and maintenance, attendants.
  - c aircraft maintenance,
  - d training and checking,
  - e liaison with other emergency services,
  - f liaison with governing authorities, eg CAA, ACC, DHB,
  - g media,
  - h quality assurance, and
- (3) A list of duties and responsibilities for the key persons identified in (2) and,
- (4) An organisation chart showing associated chains of responsibility of the persons specified in (2) and (3) above, and
- (5) A description of the facilities established to support the AR/AA service including:
- a operations or dispatch room,
  - b maintenance workshop,
  - c hangars,
  - d training facilities,
  - e passenger (patient) transfer, and
  - f equipment storage, and
- (6) A list of limitations and requirements covering at least
- a flight operations, including the additional AR/AA role instrumentation or equipment,
  - b aircraft registration/s,
  - c hours of operation,
  - d operational limitations (eg day, VFR only, etc),

- e geographical limitations,
  - f flight and medical crew complements,
  - g medical equipment lists for each category of air ambulance (Note: the AIA Standards may be referenced),
  - h duty time limitations, and
- (7) Procedures for initiating AR/AA operations, including:
- a call out arrangements,
  - b dispatch criteria,
  - c dispatch facilities,
  - d dispatcher duties and responsibilities,
  - e dispatch records,
  - f aircraft availability and configuration,
  - g radio procedures,
  - h flight procedures,
  - i flight following,
  - j notification to authorities,
  - k procedures for dealing with media, and
- (8) A description of ab-initio and recurrent training programmes in accordance with AIA approved training schedules, aimed specifically at preparing flight crew and attendants for AR/AA operations including, as appropriate:
- a aircraft operations,
  - b safety around aircraft,
  - c special medical factors applicable to airborne operations,
  - d aircraft communications systems,
  - e airborne emergencies,
  - f loading/unloading of patients, and

- (9) Details of internal audit arrangements, and
- (10) Details of retention and disposal of records pertaining to AR/AA operations, including,
  - a flight records,
  - b personnel licences and renewal,
  - c training records,
  - d equipment maintenance records
  - e patient records,
  - f audit reports and follow-up actions, and
  - g departures from Standard Operating Procedures.
- (11) A description of any promotional programmes designed to enhance safety awareness, i.e. procedures for attendance at public gatherings, establishment of landing zones, patient follow-up, etc.

#### **4 AUDIT PROCEDURE**

##### **4.1 OPERATIONS MANUAL**

Applicants seeking AIA registration shall submit the company's AR/AA Operations Manual, together with their application and completed data base form to:

The Secretary  
Aviation Industry Association of NZ (Inc)  
Air Rescue/Air Ambulance Division  
PO Box 2096  
WELLINGTON

- 4.1.1 Where an operator is unable to produce an Operations Manual, other documentation that shows clearly how they intend to comply with the Standard will be acceptable. This other documentation may take the form of a "Letter of Compliance" containing as many of the elements of an operations manual as necessary - refer Section 3.
- 4.1.2 Other operators, who for any reasons are unable to produce operations manual, or Letter of Compliance, may apply for registration in the knowledge that an AIA appointed independent auditor will be required to make a visit to the applicant's operating base. During this visit, the auditor, in consultation with the applicant, will document how compliance with the Standard is to be achieved.

4.1.3 Operations Manuals, Letters of Compliance, or audit visit documented procedures shall be used for subsequent audits.

#### 4.2 AUDIT ASSESSMENTS (INITIAL)

4.2.1 The AIA appointed independent auditor will assess the submitted Operations Manual or Letter of Compliance for conformity with the Standards.

4.2.2 Applicants whose documentation satisfies the auditor that adherence to the documented procedures and standards will achieve compliance with the Standard, shall be accredited by the AIA for a period not exceeding two years.

4.2.3 Applicants whose documentation does not satisfy the auditor that compliance with the Standard can be achieved by adherence to the documented procedures will have the deficiencies brought to their attention by way of a “Deficiency Report” raised by the auditor. The applicant may elect to re-examine the documented procedures and submit amendments to the Operations Manual or Letter of Compliance, or alternatively request a site visit by the auditor. During this visit measures to correct the deficiencies will be documented by the auditor. Once applicants have incorporated the appropriate amendments into their Operations Manual or Letter of Compliance to the satisfaction of the auditor, they will be certificated by AIA for a period not exceeding two years.

#### 4.3 MANUAL REVISION

4.3.1 To facilitate follow-up audits, operators may elect to issue amendments to their Operations Manuals or Letter of Compliance to ensure that compliance with the Standards is maintained at the highest level.

#### 4.4 POST ACCREDITATION AUDITS

4.4.1 Within two years of receiving initial AIA Accreditation, operators shall be audited by an AIA appointed independent auditor. This audit will be conducted on site and carried out with reference to the member’s Operations Manual, Letter of Compliance or the original site visit report. During the two-year interval members will be expected to have fully implemented their operations in line with documented procedures and to have accumulated records of their AR/AA activities.

4.4.2 If the post certification audit confirms that the operator is in full compliance with their procedures manual, letter of compliance or visit report, AIA Accreditation will be extended for a further two years.

4.4.3 If the post certification audit results in corrective action notices being issued by the auditor, Accreditation may be extended for a further period of up to two years. During this period, the operator will be expected to implement the corrective actions within a reasonable time frame, as agreed with the auditor, and amend the Operations Manual, Letter of Compliance or visit report.

#### 4.5 SUBSEQUENT AUDITS

4.5.1 Subsequent audits will be carried out at two yearly intervals, depending on the results of the previous audits.

### **5 APPEAL PROCEDURES**

An operator who wishes to dispute the results of an audit may lodge an appeal to the AIA Chief Executive Officer. The appeal shall be tabled for early resolution by the Audit Review Panel comprising the AIA Air Rescue / Air Ambulance Division Secretary, one Medical Adviser to the Air Rescue/Air Ambulance Division, and one independent member of the Air Rescue/Air Ambulance Division having no commercial or other interest in the outcome of the appeal.

### **6 AUDIT FEES**

The Auditor on completion of the Audit will invoice the actual cost of each audit to the applicant. There may also be a fee charged by the AIA for the administration of the scheme and to cover the cost of the certification process.

## **ANNEX H - TERMINATION OR AMENDMENT OF AIR RESCUE AIR AMBULANCE ACCREDITATION**

### **OPERATORS RIGHT TO WITHDRAW**

Each operator has the right to withdraw from the Air Rescue Air Ambulance Accreditation scheme at any stage. Following the operator's decision to withdraw from the Scheme the Accreditation Certificate, and any other items referring directly or indirectly to AIA Accreditation status must be returned to AIA office within 30 days.

If an operator withdraws from the Accreditation scheme after the Air Rescue Air Ambulance Certificate has been issued then no refund of the Accreditation fee, or any part thereof, will be made. If an operator withdraws prior to, or before the audit process is complete, a refund of a proportionate amount of the Accreditation fee less the audit costs incurred to the date of withdrawal will be made.

An operator's decision to withdraw from Air Rescue Air Ambulance Accreditation does not prevent or prohibit a subsequent re-application for AIA Air Rescue Air Ambulance Accreditation.

### **AIA ACCREDITATION AUTHORITY**

AIA may, in its sole discretion, terminate or amend an operators Accreditation status in the event of an operator no longer being in compliance with the required Accreditation standard. In the event of termination or amendment of an operators Accreditation status, the operator must return to the AIA office within 30 days the Accreditation Certificate and all other items referring directly or indirectly to the Accreditation status.

#### *Amendment of Accreditation Status*

From time to time an operator's Accreditation status may require amendment. Amendment shall, in the first instance, be facilitated by informal discussion between the operator, AIA and the AIA Auditor. In the event of this procedure not achieving a satisfactory resolution the procedure for "Termination of Accreditation" will be invoked.

#### *Termination of Accreditation*

If an operator is deemed by AIA to be no longer fit, or does not comply with the requirements to hold Air Rescue Air Ambulance Accreditation, or a mutually agreed upon amendment to an operator's Accreditation status cannot be found the following procedure will be invoked.

An operator, who is no longer deemed fit, or deemed as not complying with the Accreditation requirements, will be audited by the AIA Auditor at the request of the AIA Audit Review Panel. The Audit Review Panel shall comprise of the AIA Air Rescue/Air Ambulance Secretary, one Medical Adviser to the Air Rescue/Air Ambulance Division, and one independent member of the Air Rescue/Air Ambulance Division.

The operator shall be advised of the impending audit at least fourteen (14) days prior to the commencement of the audit.

The AIA Auditor shall provide to the Audit Review Panel the result of the audit, and the Audit Review Panel will make a recommendation within 30 days of the receipt of the audit of its determination to withdraw or maintain the operator's Accreditation. The Audit Review Panel will, at the same time notify the operator of its recommendation.

A recommendation to withdraw Accreditation shall be determined by the Air Rescue/Air Ambulance Division Committee, which will make a final determination on the recommendation of the Audit Review Panel. For a decision to be made at least half of the total number of current Committee members, but no fewer than five members, must vote and any Committee member having a conflict of interest must record the conflict of interest and is not eligible to vote.

The operator who is affected by the Audit Review Panels recommendation may make submissions to the Committee prior to the Committee reaching its decision. The submissions may be presented either in person or in writing. The Committee's decision shall be notified to the operator who, in the event of an adverse decision, may lodge with the AIA Air Rescue /Air Ambulance Secretary an appeal against that decision.

Upon receipt of an appeal lodged against the Committee's decision, AIA will invite the operator to provide such submissions, as that operator deems appropriate for consideration by the Air Rescue/Air Ambulance Division Committee. The operator has the right to attend the Committee meeting to make personal submissions. The Committee shall then vote to determine whether the original ruling of the Committee is confirmed or reversed.

If an operator is no longer deemed fit, or deemed as not complying with the Accreditation requirements, the operator is responsible for notifying all affected parties using the service that their Accreditation status has changed.

The appeal to the Committee shall be final and binding and an operator has no further rights of appeal or review, but is at liberty to re-apply for Air Rescue Air Ambulance Accreditation at any time thereafter.