



## **CAR OPS 2H**

# **GENERAL AVIATION OPERATIONS (HELICOPTER)**

**FOREWORD**

**CONTENTS**

**REVISION RECORD**

**LIST of EFFECTIVE PAGES**



## FOREWORD

- (a) The Civil Aviation Authority of San Marino is known in these regulations as the “Authority”.
- (b) [CAR OPS 2H addresses General Aviation operations for helicopters. It includes Standards and Recommended Practices up to and including ICAO Annex 6, Part II, Amendment 43.
- (c) The CAR OPS 2H numbering system aligns with CAR OPS 2A, Part I numbering system wherever possible.]
- (d) The editing practices used in this document are as follows:
  - (1) ‘Shall’ is used to indicate a mandatory requirement.
  - (2) ‘Should’ is used to indicate a recommendation.
  - (3) ‘May’ is used to indicate discretion by the Authority, the industry or the applicant, as appropriate.
  - (4) ‘Will’ indicates a mandatory requirement.

*Note: The use of the male gender implies the female gender and vice versa.*

- (e) Paragraphs and sub-paragraphs with new, amended and corrected text will be enclosed within square brackets until a subsequent amendment is issued.
- (f) Unless otherwise stated, the definitions and abbreviations contained in CAR DEF are applicable to these regulations.



## REVISION RECORD

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|               |                  |                                      |
|               |                  |                                      |



## LIST OF EFFECTIVE PAGES

|     |           |
|-----|-----------|
| i   | 26 Nov 26 |
| ii  | 26 Nov 26 |
| iii | 26 Nov 26 |
| iv  | 26 Nov 26 |
| v   | 26 Nov 26 |
| vi  | 26 Nov 26 |
| vii | 26 Nov 26 |

**Subpart A**

|     |           |
|-----|-----------|
| A-1 | 26 Nov 26 |
| A-2 | 26 Nov 26 |
| A-3 | 26 Nov 26 |

**Subpart B**

|     |           |
|-----|-----------|
| B-1 | 26 Nov 26 |
| B-2 | 26 Nov 26 |
| B-3 | 26 Nov 26 |
| B-4 | 26 Nov 26 |

**Subpart C**

|      |           |
|------|-----------|
| C-1  | 26 Nov 26 |
| C-2  | 26 Nov 26 |
| C-3  | 26 Nov 26 |
| C-4  | 26 Nov 26 |
| C-5  | 26 Nov 26 |
| C-6  | 26 Nov 26 |
| C-7  | 26 Nov 26 |
| C-8  | 26 Nov 26 |
| C-9  | 26 Nov 26 |
| C-10 | 26 Nov 26 |
| C-11 | 26 Nov 26 |
| C-12 | 26 Nov 26 |

**Subpart D**

|      |           |
|------|-----------|
| D-1  | 26 Nov 26 |
| D-2  | 16 Apr 20 |
| D-3  | 16 Apr 20 |
| D-4  | 16 Apr 20 |
| D-5  | 16 Apr 20 |
| D-6  | 16 Apr 20 |
| D-7  | 16 Apr 20 |
| D-8  | 16 Apr 20 |
| D-9  | 16 Apr 20 |
| D-10 | 16 Apr 20 |
| D-11 | 16 Apr 20 |
| D-12 | 16 Apr 20 |
| D-13 | 16 Apr 20 |

|      |           |
|------|-----------|
| D-14 | 16 Apr 20 |
| D-15 | 16 Apr 20 |
| D-16 | 16 Apr 20 |
| D-17 | 16 Apr 20 |
| D-18 | 16 Apr 20 |

**Subpart E**

|      |           |
|------|-----------|
| E-1  | 26 Nov 26 |
| E-2  | 26 Nov 26 |
| E-3  | 26 Nov 26 |
| E-4  | 26 Nov 26 |
| E-5  | 26 Nov 26 |
| E-6  | 26 Nov 26 |
| E-7  | 26 Nov 26 |
| E-8  | 26 Nov 26 |
| E-9  | 26 Nov 26 |
| E-10 | 26 Nov 26 |
| E-11 | 26 Nov 26 |
| E-12 | 26 Nov 26 |
| E-13 | 26 Nov 26 |
| E-14 | 26 Nov 26 |
| E-15 | 26 Nov 26 |
| E-16 | 26 Nov 26 |
| E-17 | 26 Nov 26 |
| E-18 | 26 Nov 26 |
| E-19 | 26 Nov 26 |
| E-20 | 26 Nov 26 |
| E-21 | 26 Nov 26 |
| E-22 | 26 Nov 26 |
| E-23 | 26 Nov 26 |
| E-24 | 26 Nov 26 |
| E-25 | 26 Nov 26 |
| E-26 | 26 Nov 26 |
| E-27 | 26 Nov 26 |
| E-28 | 26 Nov 26 |
| E-29 | 26 Nov 26 |
| E-30 | 26 Nov 26 |
| E-31 | 26 Nov 26 |
| E-32 | 26 Nov 26 |
| E-33 | 26 Nov 26 |
| E-34 | 26 Nov 26 |
| E-35 | 26 Nov 26 |

**Subpart F**

|     |           |
|-----|-----------|
| F-1 | 26 Nov 26 |
| F-2 | 26 Nov 26 |
| F-3 | 26 Nov 26 |
| F-4 | 26 Nov 26 |

**Subpart G**

|     |           |
|-----|-----------|
| G-1 | 26 Nov 26 |
| G-2 | 26 Nov 26 |
| G-3 | 26 Nov 26 |

**Subpart H**

|     |           |
|-----|-----------|
| H-1 | 01 Jan 20 |
|-----|-----------|

**Subpart I**

|     |           |
|-----|-----------|
| I-1 | 26 Nov 26 |
|-----|-----------|

**Subpart J**

|               |           |
|---------------|-----------|
| J-1           | 26 Nov 26 |
| <i>- End-</i> |           |



## CONTENTS

### SUBPART A    **APPLICABILITY**

|            |                                       |     |
|------------|---------------------------------------|-----|
| OPS 2H.001 | Applicability .....                   | A-1 |
| OPS 2H.002 | Exemptions .....                      | A-1 |
| OPS 2H.003 | Leasing and Interchange .....         | A-1 |
| OPS 2H.004 | Fractional Ownership Operations ..... | A-3 |

### SUBPART B    **GENERAL**

|            |                                                                    |     |
|------------|--------------------------------------------------------------------|-----|
| OPS 2H.101 | Compliance with Laws, Regulations and Procedures .....             | B-1 |
| OPS 2H.102 | Dangerous Goods .....                                              | B-1 |
| OPS 2H.104 | Use of Psychoactive Substances .....                               | B-2 |
| OPS 2H.106 | Specific Approvals .....                                           | B-2 |
| OPS 2H.107 | [Protection of Recordings and Transcripts] .....                   | B-3 |
| OPS 2H.108 | Helicopter Operated under an Article 83 <i>bis</i> Agreement ..... | B-4 |

### SUBPART C    **FLIGHT OPERATIONS**

#### *[Operational Management (Before Flight)]*

|            |                                                     |     |
|------------|-----------------------------------------------------|-----|
| OPS 2H.201 | Operating Facilities .....                          | C-1 |
| OPS 2H.202 | Operating Instructions .....                        | C-1 |
| OPS 2H.203 | Heliport or Landing Location Operating Minima ..... | C-1 |
| OPS 2H.204 | [Briefings .....                                    | C-3 |
| OPS 2H.206 | Flight Preparation] .....                           | C-3 |
| OPS 2H.207 | Flight Planning .....                               | C-4 |
| OPS 2H.208 | Meteorological Conditions .....                     | C-4 |
| OPS 2H.209 | Flight in Icing Conditions .....                    | C-5 |
| OPS 2H.211 | Alternate Heliports .....                           | C-5 |
| OPS 2H.212 | Fuel and Oil Requirements .....                     | C-6 |
| OPS 2H.213 | Refuelling with Passengers on Board .....           | C-7 |
| OPS 2H.214 | Oxygen Supply .....                                 | C-8 |

#### *In-flight procedures*

|            |                                                            |      |
|------------|------------------------------------------------------------|------|
| OPS 2H.216 | Operating Minima .....                                     | C-8  |
| OPS 2H.217 | [Meteorology and Operational Observations by Pilots] ..... | C-9  |
| OPS 2H.218 | Hazardous Flight Conditions .....                          | C-9  |
| OPS 2H.219 | Flight Crew Members at Duty Stations .....                 | C-9  |
| OPS 2H.221 | Use of Oxygen .....                                        | C-9  |
| OPS 2H.222 | In-flight Fuel Management .....                            | C-10 |
| OPS 2H.223 | Instrument Approach Procedures .....                       | C-11 |
| OPS 2H.224 | Duties of the Pilot-in-Command .....                       | C-11 |
| OPS 2H.226 | [Cabin Baggage (Take-off and Landing)] .....               | C-12 |
| OPS 2H.227 | Flight Operations Officer/Flight Dispatcher .....          | C-12 |
| OPS 2H.228 | Over Water Flight Certification .....                      | C-12 |

### SUBPART D    **PERFORMANCE OPERATING LIMITATIONS**

|            |               |     |
|------------|---------------|-----|
| OPS 2H.301 | General ..... | D-1 |
|------------|---------------|-----|



|            |                                                                             |      |
|------------|-----------------------------------------------------------------------------|------|
| Appendix 1 | Helicopter Performance and Operating Limitations .....                      | D-2  |
| 1.         | General.....                                                                | D-2  |
| 1.1        | Purpose and Scope .....                                                     | D-2  |
| 1.2        | Performance – General .....                                                 | D-2  |
| 1.3        | General Requirements.....                                                   | D-2  |
| 1.4        | Abbreviations Specific to Helicopter Operations .....                       | D-3  |
| 1.5        | Definitions.....                                                            | D-3  |
| 2.         | Requirements .....                                                          | D-4  |
| 2.1        | Applicability .....                                                         | D-4  |
| 2.2        | Significant Performance Factors.....                                        | D-4  |
| 2.3        | Operating Conditions .....                                                  | D-5  |
| 2.4        | Obstacle Accountability Area .....                                          | D-5  |
| 2.5        | Source of Performance Data .....                                            | D-6  |
| 3.         | Operating Area Considerations.....                                          | D-6  |
| 3.1        | FATO .....                                                                  | D-6  |
| 4.         | Limitations resulting from performance .....                                | D-7  |
| 4.1        | Operations in Performance Class 1 .....                                     | D-7  |
|            | Figure 1 – Performance Class 1 Surface Level Heliport Take-off .....        | D-8  |
|            | Figure 2 – Performance Class 1 Surface Level Heliport Option Take-off ..... | D-9  |
|            | Figure 3 – Performance Class 1 Elevated Heliport Take-off.....              | D-10 |
|            | Figure 4 – Performance Class 1 Surface Level Heliport Landing .....         | D-11 |
|            | Figure 5 – Performance Class 1 Elevated Heliport Landing .....              | D-12 |
| 4.2        | Operations in performance Class 2 .....                                     | D-12 |
|            | Figure 6 – Performance Class 2 Surface Level Heliport Take-off .....        | D-14 |
|            | Figure 7 – Performance Class 2 Elevated Heliport Take-off.....              | D-15 |
|            | Figure 8 – Performance Class 2 Surface Level Heliport Landing .....         | D-16 |
|            | Figure 9 – Performance Class 2 Elevated Heliport Landing .....              | D-17 |
| 4.3        | Operations in Performance Class 3.....                                      | D-17 |

## **SUBPART E INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS**

|            |                                                                                  |      |
|------------|----------------------------------------------------------------------------------|------|
| OPS 2H.401 | General .....                                                                    | E-1  |
| OPS 2H.402 | Instruments and Equipment – General .....                                        | E-1  |
| OPS 2H.403 | Marking of Break-In Points.....                                                  | E-2  |
| OPS 2H.404 | Instruments and Equipment - Day VFR .....                                        | E-3  |
| OPS 2H.406 | Instruments and Equipment - Night VFR.....                                       | E-3  |
| OPS 2H.407 | Operating Lights for Night Operations .....                                      | E-4  |
| OPS 2H.408 | Instruments and Equipment – IFR.....                                             | E-4  |
| OPS 2H.409 | Flight Over Water – Emergency Equipment .....                                    | E-5  |
| OPS 2H.412 | Flights Over Designated Land Areas .....                                         | E-6  |
| OPS 2H.413 | High Altitude Flights .....                                                      | E-6  |
| OPS 2H.414 | Noise Certification .....                                                        | E-6  |
| OPS 2H.416 | Emergency Locator Transmitter (ELT) .....                                        | E-6  |
| OPS 2H.417 | Pressure-Altitude Reporting Transponder .....                                    | E-7  |
| OPS 2H.418 | Microphones .....                                                                | E-7  |
| OPS 2H.419 | Helicopters Equipped with ALS, HUD or Equivalent Displays, EVS, SVS and CVS..... | E-7  |
| OPS 2H.422 | Electronic Flight Bags (EFB) .....                                               | E-7  |
| OPS 2H.423 | Documents to be Carried .....                                                    | E-8  |
| OPS 2H.427 | Cockpit Voice Recorders .....                                                    | E-9  |
| OPS 2H.429 | Flight Data Recorders .....                                                      | E-9  |
| OPS 2H.431 | Data Link Recording .....                                                        | E-10 |
| OPS 2H.433 | Combination Recorders .....                                                      | E-10 |



|                                                                         |                                                                               |      |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|------|
| Appendix 1 to<br>OPS 2H.407                                             | Lights to be Displayed by Helicopters .....                                   | E-11 |
| Appendix 1 to<br>OPS 2H.427                                             | Cockpit Voice Recorder and Cockpit Audio Recording System (CARS) .....        | E-15 |
| Appendix 1 to<br>OPS 2H.427 to<br>2.433 inclusive                       | Flight Recorders – General.....                                               | E-17 |
| Appendix 2 to<br>OPS 2H.427 to<br>2.433 inclusive                       | Inspection of Flight Recorder Systems .....                                   | E-20 |
| Appendix 1 to<br>OPS 2H.429                                             | Flight Data Recorder (FDR) and Aircraft Data Recording Systems (ADRS) .....   | E-22 |
| Appendix 2 to<br>OPS 2H.429                                             | Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS)..... | E-24 |
| Appendix 3 to<br>OPS 2H.429                                             | Parameter Characteristics for Flight Data Recorders .....                     | E-25 |
| Appendix 4 to<br>OPS 2H.429                                             | Parameter Characteristics for Aircraft Data Recording Systems .....           | E-30 |
| Appendix 1 to<br>OPS 2H.431                                             | Data Link Recorder (DLR) – Applications to be Recorded.....                   | E-35 |
| <b>SUBPART F COMMUNICATION, NAVIGATION &amp; SURVEILLANCE EQUIPMENT</b> |                                                                               |      |
| OPS 2H.501                                                              | Communication Equipment.....                                                  | F-1  |
| OPS 2H.502                                                              | Navigation Equipment.....                                                     | F-2  |
| OPS 2H.503                                                              | Performance Based Navigation .....                                            | F-2  |
| OPS 2H.507                                                              | Surveillance Equipment .....                                                  | F-3  |
| OPS 2H.508                                                              | Electronic Navigation Data Management .....                                   | F-4  |
| <b>SUBPART G [CONTINUING AIRWORTHINESS</b>                              |                                                                               |      |
| OPS 2H.601                                                              | Owner’s Continuing Airworthiness Responsibilities].....                       | G-1  |
| OPS 2H.602                                                              | Continuing Airworthiness Records .....                                        | G-1  |
| OPS 2H.603                                                              | Modifications and Repairs.....                                                | G-2  |
| OPS 2H.604                                                              | Maintenance Release .....                                                     | G-2  |
| OPS 2H.606                                                              | Continuing Airworthiness Information .....                                    | G-2  |
| OPS 2H.607                                                              | [Maintenance Programme] .....                                                 | G-2  |
| OPS 2H.608                                                              | Technical Log.....                                                            | G-3  |
| <b>SUBPART H FLIGHT CREW</b>                                            |                                                                               |      |
| OPS 2H.701                                                              | Qualifications .....                                                          | H-1  |
| OPS 2H.703                                                              | Composition of the Flight Crew .....                                          | H-1  |

**[SUBPART I    MANUALS, LOGS AND RECORDS**

|            |                                                           |     |
|------------|-----------------------------------------------------------|-----|
| OPS 2H.801 | Flight Manual .....                                       | I-1 |
| OPS 2H.802 | Journey Log Book .....                                    | I-1 |
| OPS 2H.803 | Records of Emergency and Survival Equipment Carried ..... | I-1 |

**SUBPART J    SECURITY**

|            |                                               |     |
|------------|-----------------------------------------------|-----|
| OPS 2H.901 | Security of Helicopter .....                  | J-1 |
| OPS 2H.902 | Reporting Acts of Unlawful Interference]..... | J-1 |

**SUBPART A****APPLICABILITY****OPS 2H.001 Applicability**

CAR OPS 2H applies to all international General Aviation helicopter operations.

*[Note: All references to heliports and landing locations includes aerodromes as defined in CAR DEF.]*

**OPS 2H.002 Exemptions**

The Authority may exceptionally grant an exemption from the provisions of CAR OPS 2H when satisfied that there is a need and subject to compliance with any supplementary condition the Authority considers necessary in order to ensure an acceptable level of safety in the particular case.

**OPS 2H.003 Leasing and Interchange**

- (a) An operator may lease a helicopter with flight crew to another person for a private operation for the following;
- (1) Ferry or training flights;
  - (2) Specialised operations such as aerial photography or survey, or pipeline patrol only;
  - (3) Flights for the demonstration of a helicopter to prospective customers when no charge is made except for those specified in paragraph (c) of this section;
  - (4) Flights conducted by the operator of a helicopter for his personal transportation, or the transportation of his guests when no charge, assessment, or fee is made for the transportation;
  - (5) Carriage of officials, employees, guests, and property of a company on a helicopter operated by that company, or the parent or a subsidiary of the company or a subsidiary of the parent, when the carriage is within the scope of, and incidental to, the business of the company (other than transportation by air) and no charge, assessment or fee is made for the carriage in excess of the cost of owning, operating, and maintaining the helicopter, except that no charge of any kind may be made for the carriage of a guest of a company, when the carriage is not within the scope of, and incidental to, the business of that company;
  - (6) The carriage of company officials, employees, and guests of the company on a helicopter operated under a time sharing, interchange, or joint ownership agreement as defined in paragraph (b);
  - (7) The carriage of property (other than mail) on a helicopter operated by a person in the furtherance of a business or employment (other than transportation by air) when the carriage is within the scope of, and incidental to, that business or employment and no charge, assessment, or fee is made for the carriage other than those specified in paragraph (c);
  - (8) The carriage on a helicopter of an athletic team, sports group, choral group, or similar group having a common purpose or objective when there is no charge, assessment, or fee of any kind made by any person for that carriage; and



- (9) The carriage of persons on a helicopter operated by a person in the furtherance of a business other than transportation by air for the purpose of selling them land, goods, or property, including franchises or distributorships, when the carriage is within the scope of, and incidental to, that business and no charge, assessment, or fee is made for that carriage.
- (10) Any operation identified in paragraphs (a)(1) through (a)(9) of this section when conducted;
- (i) by a fractional ownership programme manager under OPS 2H.005, or
  - (ii) by a fractional owner in a fractional ownership programme aircraft, except that a flight under a joint ownership arrangement under paragraph (a)(6) of this section may not be conducted. For a flight under an interchange agreement under paragraph (a)(6) of this section, the exchange of equal time for the operation must be properly accounted for as part of the total hours associated with the fractional owner's share of ownership.
- (b) For the purpose of paragraph (a);
- (1) A *time sharing agreement* means an arrangement whereby a person leases his/her helicopter with flight crew to another person, and no charge is made for the flights conducted under that arrangement other than those specified in paragraph (c) of this section;
  - (2) An *interchange agreement* means an arrangement whereby a person leases his/her helicopter to another person in exchange for equal time, when needed, on the other person's helicopter, and no charge, assessment, or fee is made, except that a charge may be made not to exceed the difference between the cost of owning, operating, and maintaining the two helicopters;
  - (3) A *joint ownership agreement* means an arrangement whereby one of the registered joint owners of a helicopter employs and furnishes the flight crew for that helicopter and each of the registered joint owners pays a share of the charge specified in the agreement.
- (c) The following may be charged, as expenses of a specific flight, for transportation as authorised by paragraphs (a)(3) and (7) and (b)(1);
- (1) Fuel, oil, lubricants, and other additives.
  - (2) Travel expenses of the crew, including food, lodging, and ground transportation.
  - (3) Hangar and tie-down costs away from the helicopter's base of operation.
  - (4) Insurance obtained for the specific flight.
  - (5) Landing fees, airport taxes, and similar assessments.
  - (6) Customs, foreign permit, and similar fees directly related to the flight.
  - (7) In flight food and beverages.
  - (8) Passenger ground transportation.
  - (9) Flight planning and weather contract services.
  - (10) An additional charge equal to 100% of the expenses listed in sub-paragraph (c)(1).

**OPS 2H.004 Fractional Ownership Operations**

- (a) No person shall engage in a fractional ownership operation unless specifically approved by the Authority and in accordance with any directives and management specifications issued by the Authority governing;
- (1) the provision of programme management services in a fractional ownership programme;
  - (2) the operation of a fractional ownership programme aircraft in a fractional ownership programme; and
  - (3) the operation of a programme aircraft included in a fractional ownership programme managed by an affiliate of the manager of the programme to which the owner belongs.

*Note: The directives issued by the Authority are stated in CAP 29 – Fractional Ownership Programme Management.*

**SUBPART B****GENERAL****OPS 2H.101 Compliance with Laws, Regulations and Procedures**

- (a) [The pilot-in-command shall be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the areas to be traversed, the heliports or landing locations to be used and the air navigation facilities relating thereto.
- (b) The pilot-in-command shall ensure that other members of the flight crew are familiar with these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the helicopter.]
- (c) The pilot-in-command shall comply with the laws, regulations and procedures of those States in which operations are conducted.
- (d) The pilot-in-command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped.
- (e) The pilot-in-command shall have responsibility for operational control.
- (f) If an emergency situation that endangers the safety or security of the helicopter or persons necessitates the taking of action that involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the Authority, as the State of Registry of the helicopter. Such reports shall be submitted as soon as possible and normally within ten days.
- (g) The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property.
- (h) [The pilot-in-command should have available on board the helicopter the essential information concerning the search and rescue services in the area over which the helicopter will be flown.]
- (i) The pilot-in-command shall ensure that flight crew members demonstrate the ability to speak and understand the English language.

**OPS 2H.102 Dangerous Goods**

- (a) Applicability. The provisions of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc. 9284) also apply to the acceptance for loading and carriage of dangerous goods in any general aviation helicopter.
- (b) Exceptions. The General Exceptions contained in Part 1;1.1.5 of the Technical Instructions and the Exceptions contained in Part 1;2.2 of the Technical Instructions also apply to any general aviation helicopter.



- (c) Dangerous goods shall only be transported by the operator approved by the Authority except when;
  - (1) they are not subject to the Technical Instructions in accordance with Part 1 of those Instructions; or
  - (2) they are carried by passengers or the pilot-in-command, or are in baggage, in accordance with Part 8 of the Technical Instructions.
- (d) The pilot-in-command shall take all reasonable measures to prevent dangerous goods from being carried on board inadvertently.
- (e) The pilot-in-command shall, in accordance with the Technical Instructions, report without delay to the Authority and the appropriate authority of the State of occurrence in the event of any dangerous goods accidents or incidents.
- (f) The pilot-in-command shall ensure that passengers are provided with information about dangerous goods in accordance with the Technical Instructions.

#### **OPS 2H.104 Use of Psychoactive Substances**

*Note: Refer to CAR OPS 0.*

#### **OPS 2H.106 Specific Approvals**

- (a) An operator shall not operate a helicopter for the purpose of General Aviation operations otherwise than under, and in accordance with, the approvals and limitations of Specific Approvals issued for that helicopter.
- (b) The pilot-in-command shall not conduct operations for which a specific approval is required unless such approval has been issued by the Authority.
- (c) [Specific approvals shall follow the layout listed in ICAO Annex 6, Part II, Appendix 2.4 and contain the information on the following required approvals;]
  - (1) Low Visibility Operations;
  - (2) Operational credit operations for advanced aircraft, when used for low visibility operations;
  - (3) Performance Based Operations (PBN);
  - (4) Carriage of Dangerous Goods;
  - (5) Use of EFB (installed or portable);
  - (6) Use of CPDLC;
  - (7) Use of ADS-B Out;
  - (8) Use of ADS C;
  - (9) Required Communications Performance (RCP);
  - (10) Required Surveillance Performance (RSP); and



- (11) Fractional Ownership management operations.

#### **OPS 2H.107 [Protection of Recordings and Transcripts]**

- (a) Until 22 November 2028, the Authority shall not allow the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per ICAO Annex 13, except where the recordings or transcripts are;
- (1) related to a safety-related event identified in the context of a safety management system; are restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by CAR SMS, Appendix 3;
  - (2) sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by CAR SMS, Appendix 3; or
  - (3) used for inspections of flight recorder systems (refer to Appendix 2 to OPS 2H.427 to 2H.433 inclusive).
- (b) As of 23 November 2028, the Authority shall not allow the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS except where the recordings or transcripts are:
- (1) used in the investigation of an accident or incident instituted under Annex 13;
  - (2) used in the assessment of a safety-related event identified in the context of a safety management system, in which case such use is restricted to the relevant portions of a de identified transcript of the recording and is subject to the protections accorded by CAR SMS;
  - (3) sought for use in criminal proceedings not related to an event involving an Annex 13 accident or incident investigation, in which case such use is restricted to the relevant portions disclosed under authoritative safeguards; or
  - (4) used for inspections of flight recorder systems as provided in Appendix 2 to OPS 2H.427 to OPS 2H.433 inclusive.

*Note 1: When an investigation under Annex 13 is instituted, the protection accorded to accident and investigation records, including recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS, is determined in accordance with Annex 13. Provisions on the protection of safety data, and safety information collected for purposes of maintaining or improving safety, as well as related sources are contained in CAR SMS.*

*Note 2: Authoritative safeguards include legal limitations or restrictions such as protective orders, closed proceedings, in-camera review, and de-identification of data for the use or disclosure of safety information in criminal proceedings.*

- (c) Until 22 November 2028, the Authority shall not allow the use of recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS for purposes other than the investigation of an accident or incident as per ICAO Annex 13, except where the recordings or transcripts are subject to the protections accorded by CAR SMS, Appendix 3 and are:
- (1) used by the operator for airworthiness or maintenance purposes;



- (2) sought for use in proceedings not related to an event involving an accident or incident investigation;
- (3) de-identified; or
- (4) disclosed under secure procedures.

*Note 1: When an investigation under Annex 13 is instituted, investigation records are subject to the protections accorded by Annex 13.*

*Note 2: Provisions on the protection of safety data, safety information and related sources are contained in CAR SMS, Appendix 3.*

- (d) As of 23 November 2028, the Authority shall not allow the use of recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS except where the recordings or transcripts are;
  - (1) used in the investigation of an accident or incident instituted under Annex 13;
  - (2) used by the operator for airworthiness or maintenance purposes; or
  - (3) sought for use in proceedings not related to an event involving an accident or incident investigation;

*Note: Provisions on the protection of safety data and safety information collected for purposes of maintaining or improving safety, as well as related sources are contained in CAR SMS.]*

#### **OPS 2H.108 Helicopter operated under an Article 83 *bis* agreement**

- (a) A helicopter, when operating under an Article 83 *bis* agreement entered into between the State of Registry and the State of the principal location of a general aviation operator, shall carry a certified true copy of the agreement summary, in either an electronic or hard copy format.
- (b) When the summary is issued in a language other than English, an English translation shall be included.
- (c) The agreement summary of an Article 83 *bis* agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred under the agreement by the State of Registry to the State of the principal location of a general aviation operator, when conducting surveillance activities such as ramp checks.
- (d) The agreement summary shall be transmitted to ICAO together with the Article 83 *bis* Agreement for registration with the ICAO Council by the State of Registry or the State of the principal location of a general aviation operator.

*Note: The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council contains the list of all aircraft affected by the agreement. However, the certified true copy to be carried on board will need to list only the specific aircraft carrying the copy.*

- (e) [The agreement summary should contain the information in ICAO Annex 6, Part II, Appendix 2.5 for the specific helicopter and should follow the layout of Appendix 2.5, paragraph 2.]

**SUBPART C****FLIGHT OPERATIONS****OPS 2H.201 Operating Facilities**

- (a) [The pilot-in-command shall not commence a flight unless it has been ascertained by every reasonable means available that the ground and/or water facilities including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the helicopter, are adequate for the type of operation under which the flight is to be conducted.]

*Note: "Reasonable means" is intended to denote the use, at the point of departure, of information available to the pilot-in-command either through official information published by the aeronautical information services or readily obtainable from other sources.*

- (b) The pilot-in-command, in making a decision on the adequacy of facilities and services available at an aerodrome of intended operation, should assess the level of safety risk associated with the aircraft type and nature of the operation, in relation to the availability of rescue and fire-fighting services (RFFS).]

**OPS 2H.202 [Operating Instructions]**

A helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.]

**OPS 2H.203 Heliport or Landing Location Operating Minima**

- (a) [The pilot-in-command shall establish operating minima in accordance with criteria specified by the Authority, as the State of Registry, for each heliport or landing location to be used in operations. When establishing operating minima, any conditions that may be prescribed in the list of specific approvals shall be observed. Such minima shall not be lower than any that may be established by the State of the Aerodrome, except when specifically approved by that State.]
- (b) The Authority, as the State of Registry, shall authorise operational credit(s) for operations with advanced aircraft. Where the operational credit relates to low visibility operations, the Authority shall issue a specific approval. Such authorisations shall not affect the classification of the instrument approach procedure.

*Note: Operational credit includes:*

- (1) *[for the purposes of an approach ban or dispatch considerations, a minimum below the operating minima;]*
  - (2) *reducing or satisfying the visibility requirements; or*
  - (3) *requiring fewer ground facilities as compensated for by airborne capabilities.*
- (c) When issuing a specific approval for the operational credit, the Authority, as the State of Registry, shall ensure that the;
- (1) helicopter meets the appropriate airworthiness certification requirements;



- (2) information necessary to support effective crew tasks for the operation is appropriately available to both pilots where the number of flight crew members specified in the operations manual is more than one;
  - (3) operator/owner has carried out a safety risk assessment of the operations supported by the equipment;
  - (4) operator/owner has established and documented normal and abnormal procedures and MEL;
  - (5) operator/owner has established a training programme for the flight crew members and relevant personnel involved in the flight preparation;
  - (6) operator/owner has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and
  - (7) operator/owner has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes.
- (d) [For operations with operational credit with minima above those related to low visibility operations, the Authority, as the State of Registry shall establish criteria for the safe operation of the helicopter]
- (e) Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:
- (1) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and
  - (2) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:
    - (i) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;
    - (ii) Category II (CAT II): a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft) and a runway visual range not less than 300 m;
    - (iii) Category III: a decision height lower than 100 ft (30 m) or no decision height and a runway visual range less than 300 m or no runway visual range limitation. These are;
      - (A) Category IIIA (CAT IIIA): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range not less than 175 m;
      - (B) Category IIIB (CAT IIIB): a decision height lower than 15 m (50 ft), or no decision height and a runway visual range less than 175 m but not less than 50 m; and
      - (C) Category IIIC (CAT IIIC): no decision height and no runway visual range limitations.

*Note 1: Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT IIIA but with an RVR in the range of CAT IIIB would be considered a CAT IIIB*



*operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.*

*Note 2: The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the helicopter position and rate of change of position, in relation to the desired flight path. In the case of a circling approach operation the required visual reference is the runway environment.*

- (f) The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, if necessary, cloud conditions.
- (g) The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.
- (h) The Authority, as the State of Registry, shall issue a specific approval for instrument approach operations in low visibility which shall only be conducted when RVR information is provided.
- (i) For take-off in low visibility, the Authority, as the State of Registry, shall issue a specific approval for the minimum take-off RVR.]

#### **OPS 2H.204 Briefings**

- (a) [The pilot-in-command shall ensure that crew members and passengers are made familiar with the location and use of:
  - (1) seat belts, or harness as appropriate;]
  - (2) emergency exits;
  - (3) life jackets, if the carriage of life jackets is prescribed;
  - (4) oxygen dispensing equipment if the use of oxygen is anticipated; and
  - (5) other emergency equipment provided for individual use, including passenger emergency briefing cards.
- (b) The pilot-in-command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.
- (c) [In an emergency during flight, the pilot-in-command shall ensure that passengers are instructed in such emergency action as may be appropriate to the circumstances.
- (d) The pilot-in-command shall ensure that, during take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board a helicopter shall be secured in their seats by means of the seat belts or harnesses provided.]

#### **OPS 2H.206 [Flight Preparation]**

- (a) A flight shall not be commenced until the pilot-in-command is satisfied that:



- (1) the helicopter is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the helicopter;
  - (2) the instruments and equipment installed in the helicopter are appropriate, taking into account the expected flight conditions;
  - (3) any necessary maintenance has been performed in accordance with Subpart G of these regulations;
  - (4) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
  - (5) any load carried is properly distributed and safely secured; and
  - (6) the helicopter operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.
- (b) [The pilot-in-command should have sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.]

#### **OPS 2H.207 Flight Planning**

Before commencing a flight the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under the instrument flight rules, shall include:

- (a) a study of available current weather reports and forecasts; and
- (b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

#### **OPS 2H.208 [Meteorological Conditions]**

- (a) Flight in Accordance with VFR

A flight to be conducted in accordance with VFR shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these rules.

- (b) Flight in Accordance with IFR]

- (1) When an alternate is required.

A flight to be conducted in accordance with IFR shall not be commenced unless the available information indicates that conditions at the heliport of intended landing and at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

- (2) When no alternate is required.



A flight to be conducted in accordance with IFR to a heliport when no alternate heliport is required shall not be commenced unless available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival, or from the actual time of departure to two hours after the estimated time of arrival, whichever is the shorter period:

- (1) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and
- (2) visibility of at least 1.5 km more than the minimum associated with the procedure.

*Note: These are considered as minimum values where a reliable and continuous meteorological watch is maintained. When only an “area” type forecast is available these values may need to be increased accordingly.]*

### **OPS 2H.209 Flight in Icing Conditions**

- (a) A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.
- (b) [A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off unless the helicopter has been inspected for icing and, if necessary, has been given appropriate de-icing/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the helicopter is kept in an airworthy condition prior to take-off.]

### **OPS 2H.211 Alternate Heliports**

- (a) For a flight to be conducted in accordance with IFR, at least one destination or alternate heliport or landing location shall be selected and specified in the operational flight plan and the flight plan, unless:
  - (1) the weather conditions in OPS 2H.208(b)(2) prevail; or
  - (2)
    - (i) the heliport or landing location of intended landing is isolated and no alternate heliport or landing location is available; and
    - (ii) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and
    - (iii) a point of no return (PNR) is determined in case of an offshore destination.
- (b) Suitable offshore alternates may be specified subject to the following:
  - (1) the offshore alternates shall be used only after passing a PNR. Prior to a PNR, onshore alternates shall be used;
  - (2) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate;
  - (3) one engine inoperative performance capability shall be attainable prior to arrival at the alternate;



- (4) to the extent possible, deck availability shall be guaranteed; and
- (5) weather information must be reliable and accurate.
- (c) [Offshore alternates should not be used when it is possible to carry enough fuel to have an onshore alternate. Offshore alternates should not be used in a hostile environment.]

#### **OPS 2H.212 Fuel and Oil Requirements**

- (a) All helicopters.

A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight.

- (b) VFR operations.

The fuel and oil carried in order to comply with paragraph (a) shall, in the case of VFR operations, be at least the amount to allow the helicopter to:

- (1) fly to the landing site to which the flight is planned;
- (2) have a final reserve fuel to fly thereafter for a period of 20 minutes at best-range speed; and
- (3) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies, as determined by the State and specified in the State regulations governing general aviation.

- (c) IFR operations.

The fuel and oil carried in order to comply with paragraph (a) shall, in the case of IFR operations, be at least the amount to allow the helicopter:

- (1) When no alternate is required, in terms of OPS 2H.208(b)(2), to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:
  - (i) a final reserve fuel to fly 30 minutes at holding speed at 450 m (1500 ft) above the destination heliport or landing location under standard temperature conditions and approach and land; and
  - (ii) an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.
- (2) When an alternate is required, in terms of OPS 2H.208(b)(1), to fly to and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned, and thereafter:
  - (i) fly to and execute an approach at the alternate specified in the flight plan; and then
  - (ii) have a final reserve fuel to fly for 30 minutes at holding speed at 450 m (1500 ft) above the alternate under standard temperature conditions, and approach and land; and



- (iii) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.
- (3) [When no alternate heliport or landing location is available (i.e. the heliport of intended landing is isolated and no alternate is available), to fly to the heliport to which the flight is planned and thereafter for a period that will, based on geographic and environmental considerations, enable a safe landing to be made.]
- (d) In computing the fuel and oil required in paragraph (a), at least the following shall be considered:
  - (1) meteorological conditions forecast;
  - (2) expected air traffic control routings and traffic delays;
  - (3) for IFR flight, one instrument approach at the destination heliport, including a missed approach;
  - (4) the procedures for loss of pressurisation, where applicable, or failure of one engine while en route; and
  - (5) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

*Note: Nothing in this regulation precludes amendment of a flight plan in flight in order to replan the flight to another heliport, provided that the requirements can be complied with from the point where the flight has been replanned.*

#### **OPS 2H.213 Refuelling with Passengers on Board**

- (a) A helicopter should not be refuelled when passengers are embarking, on board or disembarking, or when the rotor is turning unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the helicopter by the most practical and expeditious means available.
- (b) When refuelling with passengers embarking, on board or disembarking, two-way communication shall be maintained by the helicopter's intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel on board the helicopter.

*[Note: Additional precautions are required when refuelling with fuels other than aviation kerosene (e.g. AVGAS) or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used. The following additional precautions should be considered;*

- (a) *doors on the refuelling side of the helicopter remain closed where possible, unless these are the only suitable exits;*
- (b) *doors on the non-refuelling side of the helicopter remain open, weather permitting, unless otherwise specified by the AFM;*
- (c) *fire-fighting facilities of the appropriate scale be positioned so as to be immediately available in the event of a fire;*



- (d) *if the presence of fuel vapour is detected inside the helicopter, or any other hazard arises during refuelling, fuelling be stopped immediately;*
- (e) *the ground or deck area beneath the exits intended for emergency evacuation be kept clear;*
- (f) *seat belts should be unfastened to facilitate rapid egress; and*
- (g) *with rotors turning, only ongoing passengers should remain on board.]*

#### **OPS 2H.214 Oxygen Supply**

- (a) The pilot-in-command shall ensure that breathing oxygen is available to crew members and passengers in sufficient quantities for all flights at such altitudes where a lack of oxygen might result in impairment of the faculties of crew members or harmfully affect passengers.
- (b) A flight to be operated at altitudes at which the cabin pressure in personnel compartments will be higher than 10000 ft shall not be commenced unless sufficient stored breathing oxygen is carried to supply:
  - (1) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the cabin pressure in compartments occupied by them will be between 10000 ft and 13000 ft; and
  - (2) the crew and passengers for any period that the cabin pressure in compartments occupied by them will be greater than 13000 ft.
- (c) A flight to be operated with a pressurised helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the cabin pressure in any compartment occupied by them would be more than 10000 ft.
- (d) In addition, when a helicopter is operated at flight altitudes at which the cabin pressure in personnel compartments is less than 25000 ft, or which, if operated at flight altitudes at which the cabin pressure in personnel compartments is more than 25000 ft and cannot descend safely within four minutes to a flight altitude at which the cabin pressure in personnel compartments is more than 13000 ft, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

#### ***In-flight Procedures***

#### **OPS 2H.216 [Operating Minima]**

- (a) [A flight shall not be continued towards the heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that heliport, or at least one destination alternate heliport, in compliance with the operating minima established in accordance with OPS 2H.203.]
- (b) An instrument approach shall not be continued below 300 m (1000 ft) above the heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the heliport operating minima.



- (c) If, after entering the final approach segment or after descending below 300 m (1000 ft) above the heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, a helicopter shall not continue its approach-to-land beyond a point at which the limits of the heliport operating minima would be infringed.

*[Note: Controlling RVR means the reported values of one or more RVR reporting locations (touchdown, midpoint and stop-end) used to determine whether operating minima are or are not met. Where RVR is used, the controlling RVR is the touchdown RVR, unless otherwise specified by State criteria.]*

#### **OPS 2H.217 [Meteorological and Operational Observations by Pilots]**

When weather conditions likely to affect the safety of other helicopters are encountered, they should be reported as soon as possible.

#### **OPS 2H.218 Hazardous Flight Conditions**

Hazardous flight conditions encountered, other than meteorological conditions, should be reported to the appropriate aeronautical station as soon as possible. The reports so rendered should give such details as may be pertinent to the safety of other aircraft.

#### **OPS 2H.219 Flight Crew Members at Duty Stations**

- (a) Take-off and landing.

All flight crew members required to be on flight deck duty shall be at their stations.

- (b) En route.

All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the helicopter or for physiological needs.

- (c) Seat belts.

All flight crew members shall keep their seat belts fastened when at their stations.

- (d) Safety harness.

When safety harnesses are provided, any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases; all other flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

*Note: Safety harness includes shoulder strap(s) and a seat belt which may be used independently.*

#### **OPS 2H.221 Use of Oxygen**

- (a) [The pilot-in-command shall ensure that he/she and flight crew members engaged in performing duties essential to the safe operation of a helicopter in flight use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in OPS 2H.214.]



- (b) Cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurisation and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurisation.

*Note: It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurisation.*

### **OPS 2H.222 In-Flight Fuel Management**

- (a) [The pilot-in-command shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to a heliport or landing location where a safe landing can be made with the planned final reserve fuel remaining.

*Note: The protection of final reserve fuel is intended to ensure safe landing at any heliport or landing location when unforeseen occurrences may not permit a safe completion of an operation as originally planned.*

- (b) [The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific heliport or landing location, the pilot calculates that any change to the existing clearance to that heliport or landing location, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

*Note 1: The declaration of MINIMUM FUEL informs ATC that all planned options have been reduced to a specific heliport or landing location of intended landing, and that no precautionary landing location is available, and any change to the existing clearance, or air traffic delays, may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.*

*Note 2: A precautionary landing location refers to a landing location, other than the location of intended landing, where it is expected that a safe landing can be made prior to the consumption of the planned final reserve fuel.*

- (c) The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the usable fuel estimated to be available upon landing at the nearest heliport or landing location where a safe landing can be made is less than the required final reserve fuel in compliance with OPS 2H.221.

*Note 1: The planned final reserve fuel refers to the value calculated in OPS 2H.221 and is the minimum amount of fuel required upon landing at any heliport or landing location. The declaration of MAYDAY MAYDAY MAYDAY FUEL informs ATC that all available landing options have been reduced to a specific location and a portion of the final reserve fuel may be consumed prior to landing.*

*Note 2: The pilot estimates with reasonable certainty that the fuel remaining upon landing at the nearest safe landing location will be less than the final reserve fuel taking into consideration the latest information available to the pilot, the area to be overflowed (i.e. with respect to the availability of precautionary landing locations), meteorological conditions and other reasonable contingencies.*



- (d) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.]

#### **OPS 2H.223 [Instrument Approach Procedures]**

- (a) One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State, to serve each final approach and take-off area or heliport utilised for instrument flight operations.
- (b) All helicopters operated in accordance with the instrument flight rules shall comply with the instrument approach procedures approved by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.]

#### **OPS 2H.224 Duties of Pilot-in-Command**

- (a) The pilot-in-command shall be responsible for the operation, safety and security of the helicopter and the safety of all crew members, passengers and cargo on board.
- (b) The pilot-in-command shall be responsible for ensuring that a flight;
- (1) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue or the effects of any psychoactive substance; and
  - (2) will not be continued beyond the nearest suitable aerodrome or operating site when a flight crew member's capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen;
- (c) The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter that results in serious injury or death of any person or substantial damage to the helicopter or property.
- (d) When undue proximity to the ground is detected by the pilot-in-command or by a ground proximity warning system, the pilot-in-command shall take corrective action immediately in order to establish safe flight conditions.
- (e) The pilot-in-command of a helicopter shall notify the operator and the Authority as soon as practicable, or within 72 hours, of any event which constitutes an occurrence as described below and which comes to that person's attention in the exercise of that person's functions.
- (1) any incident relating to such a helicopter or any defect in or malfunctioning of such a helicopter or any part or equipment of such a helicopter, being an incident, malfunctioning or defect endangering, or which if not corrected would endanger, such helicopter or its occupants or any other person; or
  - (2) any defect in or malfunctioning of any facility on the ground used or intended to be used for purposes of or in connection with the operation of such a helicopter, being a defect or malfunctioning endangering, or which if not corrected would endanger, such helicopter or its occupants; or
  - (3) any incident in flight in which the pilot-in-command of a helicopter has reason to believe that the helicopter has been in collision with one or more than one bird.

**[OPS 2H.226 Cabin baggage (take-off and landing)]**

The pilot-in-command shall ensure that all baggage carried onto a helicopter and taken into the passenger cabin is securely stowed.]

**OPS 2H.227 Flight Operations Officer/Flight Dispatcher**

Should any person be assigned as a flight operations officer/flight dispatcher, the operator shall ensure that person is trained and maintains familiarisation with all features of the operation which are pertinent to their duties, including knowledge and skills related to Human Factors.

**OPS 2H.228 Over Water Flight Certification**

[All helicopters on flights over water in a hostile environment in accordance with OPS 2H.409(a) shall be certificated for ditching. Sea state shall be an integral part of ditching information.]

**SUBPART D****PERFORMANCE OPERATING LIMITATIONS****OPS 2H.301 General**

(See Appendix 1 to OPS 2H.301)

- (a) A helicopter shall be operated;
  - (1) in compliance with the terms of its airworthiness certificate or equivalent approved document;
  - (2) within the operating limitations prescribed by the certifying authority and the Authority, as the State of Registry;
  - (3) within the operating limitations prescribed in Appendix to OPS 2H.301 by the Authority, as the State of Registry; and
  - (4) [if applicable, within the mass limitations imposed by compliance with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorised in exceptional circumstances for a certain heliport or landing location or a runway where there is no noise disturbance problem, by the State of the Aerodrome.]
- (b) Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the Authority, as the State of Registry for visual presentation, shall be displayed in the helicopter.
- (c) [Where helicopters are operating to or from heliports in a congested hostile environment within the territory of San Marino, the Authority shall take such precautions as are necessary to control the risk associated with an engine failure.
- (d) The pilot-in-command shall determine that the helicopter performance will permit the take-off and departure to be carried out safely.]

**Appendix 1 to OPS 2H.301****Helicopter Performance and Operating Limitations**

(See OPS 2H.301)

**1. General****1.1 Purpose and scope**

This attachment comprises the code of performance for helicopters operated under these regulations.

**1.2 Performance - general****1.2.1 Categories**

**Category A.** With respect to helicopters, means a multi-engine helicopter designed with engine and system isolation features specified in ICAO Annex 8, Part IVB, and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off.

**Category B.** With respect to helicopters, means a single engine or multi-engine helicopter which does not meet Category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and a forced landing is assumed.

**1.3 General requirements**

- a) Helicopters operating in performance Classes 1 and 2 shall be certificated in Category A.
- b) Helicopters operating in performance Class 3 shall be certificated in either Category A or Category B (or equivalent).
- c) Except as permitted by the Authority:
  - 1) Take-off or landing from/to heliports in a congested hostile environment shall only be conducted in performance Class 1.
  - 2) Operations in performance Class 2 shall only be conducted with a safe forced landing capability during take-off and landing.
  - 3) Operations in performance Class 3 shall only be conducted in a non-hostile environment.
- d) In order to permit variations from c), d) and e), the Authority shall, in cooperation with the operator, undertake a risk assessment, considering factors such as:
  - 1) the type of operation and the circumstances of the flight;
  - 2) the area/terrain over which the flight is being conducted;
  - 3) the probability of a critical engine failure and the consequence of such an event;
  - 4) the procedures to maintain the reliability of the engine(s);



- 5) the training and operational procedures to mitigate the consequences of the critical engine failure; and
- 6) installation and utilization of a usage monitoring system.

*Note: If there are routes with access to suitable forced landing areas, these should be used for flights into and out of the congested area. Where no such routes exist, evaluation of the operation could include consideration of mitigating factors such as the reliability of the propulsion system in the short periods when flight over a suitable forced landing area is not possible.*

## 1.4 Abbreviations Specific to Helicopter Operations

|                   |                                                  |
|-------------------|--------------------------------------------------|
| D                 | Maximum dimension of helicopter                  |
| DPBL              | Defined point before landing                     |
| DPATO             | Defined point after take-off                     |
| DR                | Distance travelled (helicopter)                  |
| FATO              | Final approach and take-off area                 |
| HFM               | Helicopter flight manual                         |
| LDP               | Landing decision point                           |
| LDAH              | Landing distance available (helicopter)          |
| LDRH              | Landing distance required (helicopter)           |
| R                 | Rotor radius of helicopter                       |
| RTODR             | Rejected take-off distance required (helicopter) |
| TDP               | Take-off decision point                          |
| TLOF              | Touchdown and lift-off area                      |
| TODAH             | Take-off distance available (helicopter)         |
| TODRH             | Take-off distance required (helicopter)          |
| V <sub>TOSS</sub> | Take-off safety speed                            |

## 1.5 Definitions

### 1.5.1 Only applicable to operations in performance Class 1

***Landing distance required (LDRH).*** The horizontal distance required to land and come to a full stop from a point 15 m (50 ft) above the landing surface.

***Rejected take-off distance required (RTODR).*** The horizontal distance required from the start of the take-off to the point where the helicopter comes to a full stop following an engine failure and rejection of the take-off at the take-off decision point.

***Take-off distance required (TODRH).*** The horizontal distance required from the start of the take-off to the point at which V<sub>TOSS</sub>, a selected height and a positive climb gradient are achieved, following failure of the critical engine being recognized at TDP, the remaining engines operating within approved operating limits.

*Note: The selected height stated above is to be determined with reference to either:*

- a) the take-off surface; or
- b) a level defined by the highest obstacle in the take-off distance required.



### 1.5.2 Applicable to operations in all performance classes

**D.** The maximum dimension of the helicopter.

**Distance DR.** DR is the horizontal distance that the helicopter has travelled from the end of the take-off distance available.

**Landing distance available (LDAH).** The length of the final approach and take-off area plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

**R.** The rotor radius of the helicopter.

**Take-off distance available (TODAH).** The length of the final approach and take-off area plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

**Take-off flight path.** The vertical and horizontal path, with the critical engine inoperative, from a specified point in the take-off to 300 m (1 000 ft) above the surface.

**Touchdown and lift-off area (TLOF).** A load bearing area on which a helicopter may touch down or lift off.

**VToss.** Take-off safety speed for helicopters certificated in Category A.

**V<sub>y</sub>.** Best rate of climb speed.

## 2. Requirements

### 2.1 Applicability

- 2.1.1 Helicopters with a passenger seating configuration of more than 19, or helicopters operating to or from a heliport in a congested hostile environment shall be operating in performance Class 1.
- 2.1.2 Helicopters with a passenger seating configuration of 19 or less but more than 9 shall be operating in performance Class 1 or 2, unless operating to or from a congested hostile environment in which case the helicopters shall be operating in performance Class 1.
- 2.1.3 Helicopters with a passenger seating configuration of 9 or less shall be operating in performance Class 1, 2 or 3, unless operating to or from a congested hostile environment in which case the helicopters shall be operating in performance Class 1.

### 2.2 Significant performance factors

To determine the performance of the helicopter, account shall be taken of at least the following factors:

- a) mass of the helicopter;
- b) elevation or pressure-altitude and temperature; and



- c) wind; for take-off and landing, accountability for wind shall be no more than 50 per cent of any reported steady headwind component of 5 knots or more. Where take-off and landing with a tailwind component is permitted in the flight manual, not less than 150 per cent of any reported tailwind component shall be allowed. Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, these values may be varied.

### 2.3 Operating conditions

2.3.1 For helicopters operating in performance Class 2 or 3 in any flight phase where an engine failure may cause the helicopter to force-land:

- a) a minimum visibility shall be defined by the operator, taking into account the characteristics of the helicopter, but shall not be less than 800 m for helicopters operating in performance Class 3; and
- b) the operator shall verify that the surface below the intended flight path permits the pilot to execute a safe forced landing.

2.3.2 Performance Class 3 operations are not to be performed:

- a) out of the sight of the surface; or
- b) at night; or
- c) when the cloud ceiling is less than 180 m (600 ft).

### 2.4 Obstacle accountability area

2.4.1 For the purpose of the obstacle clearance requirements in 4 below, an obstacle shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

- a) for VFR operations:
  - 1) half of the minimum width of the FATO (or the equivalent term used in the helicopter flight manual) defined in the helicopter flight manual (or when no width is defined, 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus:
    - 0.10 DR for VFR day operations
    - 0.15 DR for VFR night operations
- b) for IFR operations:
  - 1) 1.5 D (or 30 m, whichever is greater), plus:
    - 0.10 DR for IFR operations with accurate course guidance
    - 0.15 DR for IFR operations with standard course guidance
    - 0.30 DR for IFR operations without course guidance



- c) for operations with initial take-off conducted visually and converted to IFR/IMC at a transition point, the criteria required in 2.4.1 a) apply up to the transition point then the criteria required in 2.4.1 b) apply after the transition point.

2.4.2 For a take-off using a backup take-off procedure (or with lateral transition), for the purpose of the obstacle clearance requirements in 4 below, an obstacle located below the backup flight path (lateral flight path) shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than half of the minimum width of the FATO (or the equivalent term used in the helicopter flight manual) defined in the helicopter flight manual (when no width is defined, 0.75 D plus 0.25 times D, or 3 m, whichever is greater) plus:

- a) 0.10 distance travelled from the back edge of the FATO for VFR day operations;
- b) 0.15 distance travelled from the back edge of the FATO for VFR night operations.

2.4.3 Obstacles may be disregarded if they are situated beyond:

- a) 7 R for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- b) 10 R for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- c) 300 m if navigational accuracy can be achieved by appropriate navigation aids; and
- d) 900 m in the other cases.

*Note: Standard course guidance includes ADF and VOR guidance. Accurate course guidance includes ILS, MLS, or other course guidance providing an equivalent navigational accuracy.*

2.4.4 The transition point shall not be located before the end of TODRH for helicopters operating in performance Class 1 and before the DPATO for helicopters operating in performance Class 2.

2.4.5 When considering the missed approach flight path, the divergence of the obstacle accountability area shall only apply after the end of the take-off distance available.

## 2.5 Source of performance data

The operator shall ensure that the approved performance data contained in the helicopter flight manual is used to determine compliance with this Attachment, supplemented as necessary with other data acceptable to the State of the Operator.

## 3. Operating area considerations

### 3.1 FATO

For operations in performance Class 1, the dimensions of the FATO shall be at least equal to the dimensions specified in the helicopter flight manual.

*Note: A FATO that is smaller than the dimensions specified in the helicopter flight manual may be accepted if the helicopter is capable of a hover out of ground effect with one engine inoperative (HOGE OEI), and the conditions of 4.1 below can be met.*



## 4. Limitations resulting from performance

### 4.1 Operations in performance Class 1

#### 4.1.1 Take-off

4.1.1.1 The take-off mass of the helicopter shall not exceed the maximum take-off mass specified in the flight manual for the procedure to be used and to achieve a rate of climb of 100 ft/min at 60 m (200 ft) and 150 ft/min at 300 m (1 000 ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2 (Figure 1).

#### 4.1.1.2 Rejected take-off

The take-off mass shall be such that the rejected take-off distance required does not exceed the rejected take-off distance available.

#### 4.1.1.3 Take-off distance

The take-off mass shall be such that the take-off distance required does not exceed the take-off distance available.

*Note 1: As an alternative, the requirement above may be disregarded provided that the helicopter with the critical engine failure recognized at TDP can, when continuing the take-off, clear all obstacles from the end of the take-off distance available to the end of the take-off distance required by a vertical margin of not less than 10.7 m (35 ft) (Figure 2).*

*Note 2: For elevated heliports, the take-off technique must have appropriate clearance from the elevated heliport edge (Figure 3).*

#### 4.1.1.4 Backup procedures (or procedures with lateral transition)

The operator shall ensure that, with the critical engine inoperative, all obstacles below the backup flight path (the lateral flight path) are cleared by an adequate margin. Only the obstacles specified in 2.4.2 should be considered.

#### 4.1.2 Take-off flight path

From the end of the take-off distance required with the critical engine inoperative:

4.1.2.1 The take-off mass shall be such that the climb path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR operations and 10.7 m (35 ft) plus 0.01 DR for IFR operations above all obstacles located in the climb path. Only obstacles as specified in 2.4 should be considered.

4.1.2.2 Where a change of direction of more than 15 degrees is made, obstacle clearance requirements shall be increased by 5 m (15 ft) from the point at which the turn is initiated. This turn should not be initiated before reaching a height of 60 m (200 ft) above the take-off surface, unless permitted as part of an approved procedure in the flight manual.



## 4.1.3 En route

The take-off mass is such that it is possible, in case of the critical engine failure occurring at any point of the flight path, to continue the flight to an appropriate landing site and achieve the minimum flight altitudes for the route to be flown.

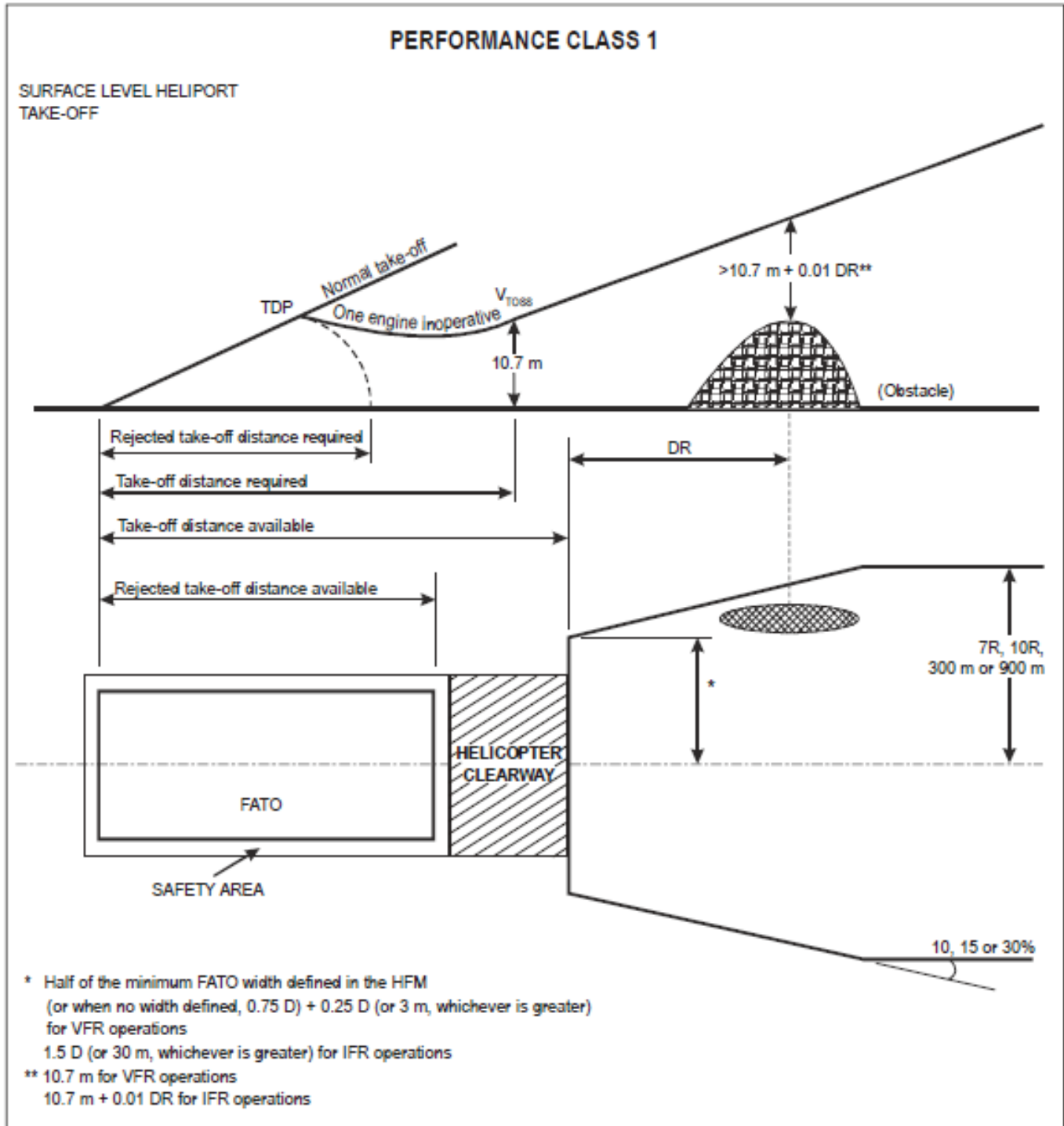


Figure 1

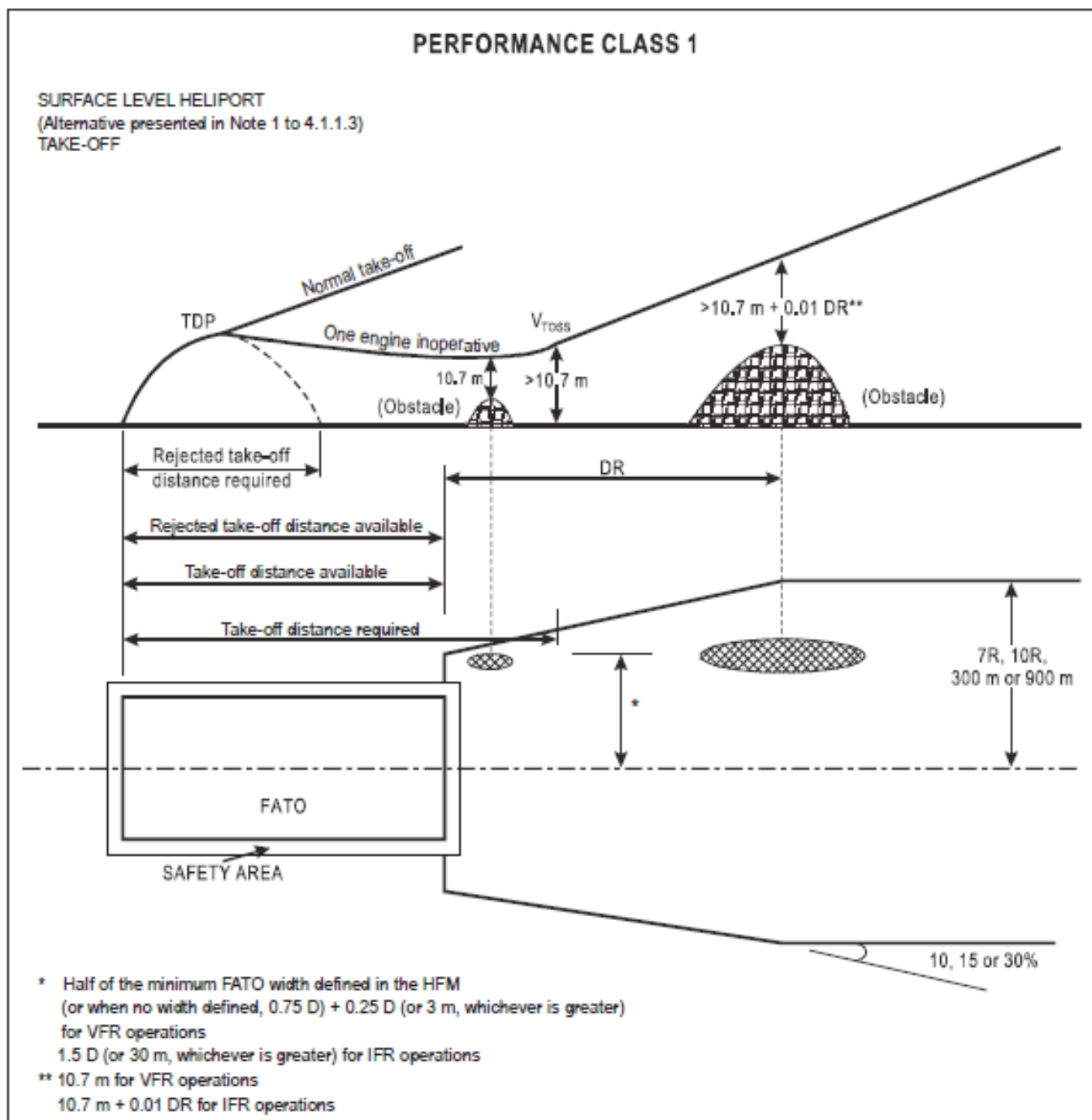


Figure 2

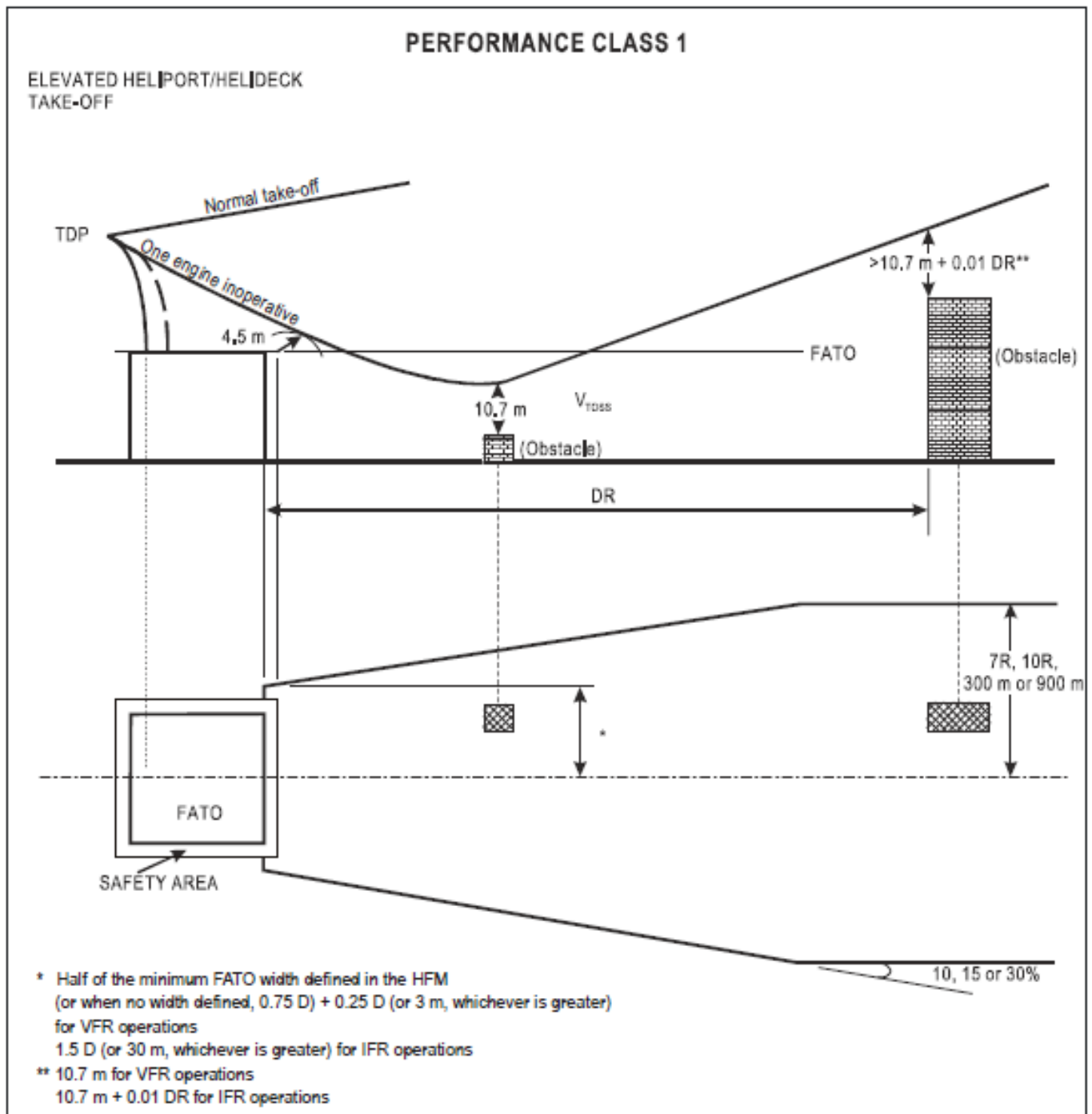


Figure 3

#### 4.1.4 Approach, landing and balked landing (Figures 4 and 5)

The estimated landing mass at the destination or alternate shall be such that:

- it does not exceed the maximum landing mass specified in the flight manual for the procedure to be used and to achieve a rate of climb of 100 ft/min at 60 m (200 ft) and 150 ft/min at 300 m (1 000 ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2;



- b) the landing distance required does not exceed the landing distance available unless the helicopter, with the critical engine failure recognized at LDP can, when landing, clear all obstacles in the approach path;
- c) in case of the critical engine failure occurring at any point after the LDP, it is possible to land and stop within the FATO; and
- d) in the event of the critical engine failure being recognized at the LDP or at any point before the LDP, it is possible either to land and stop within the FATO or to overshoot, meeting the conditions of 4.1.2.1 and 4.1.2.2.

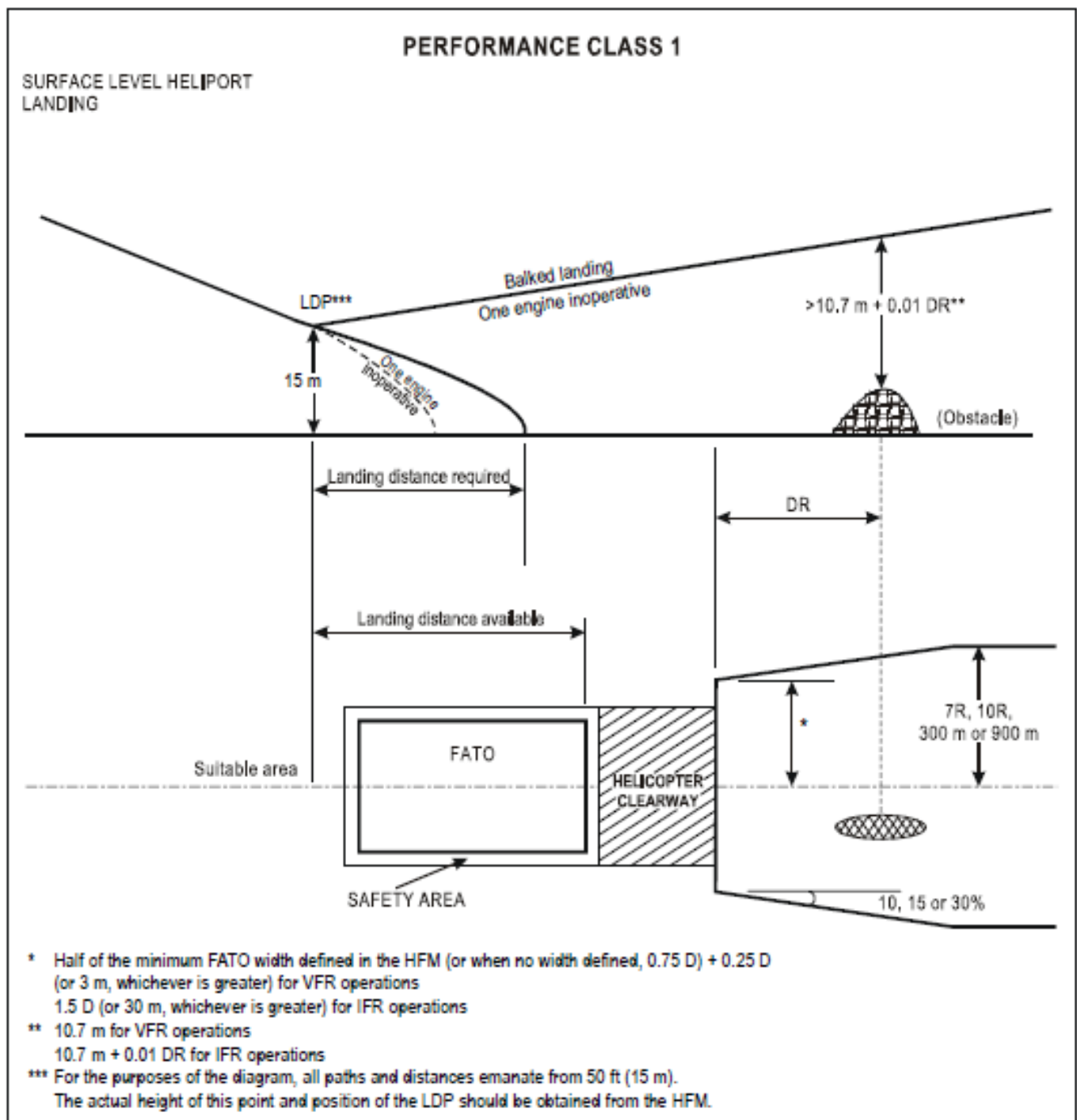


Figure 4

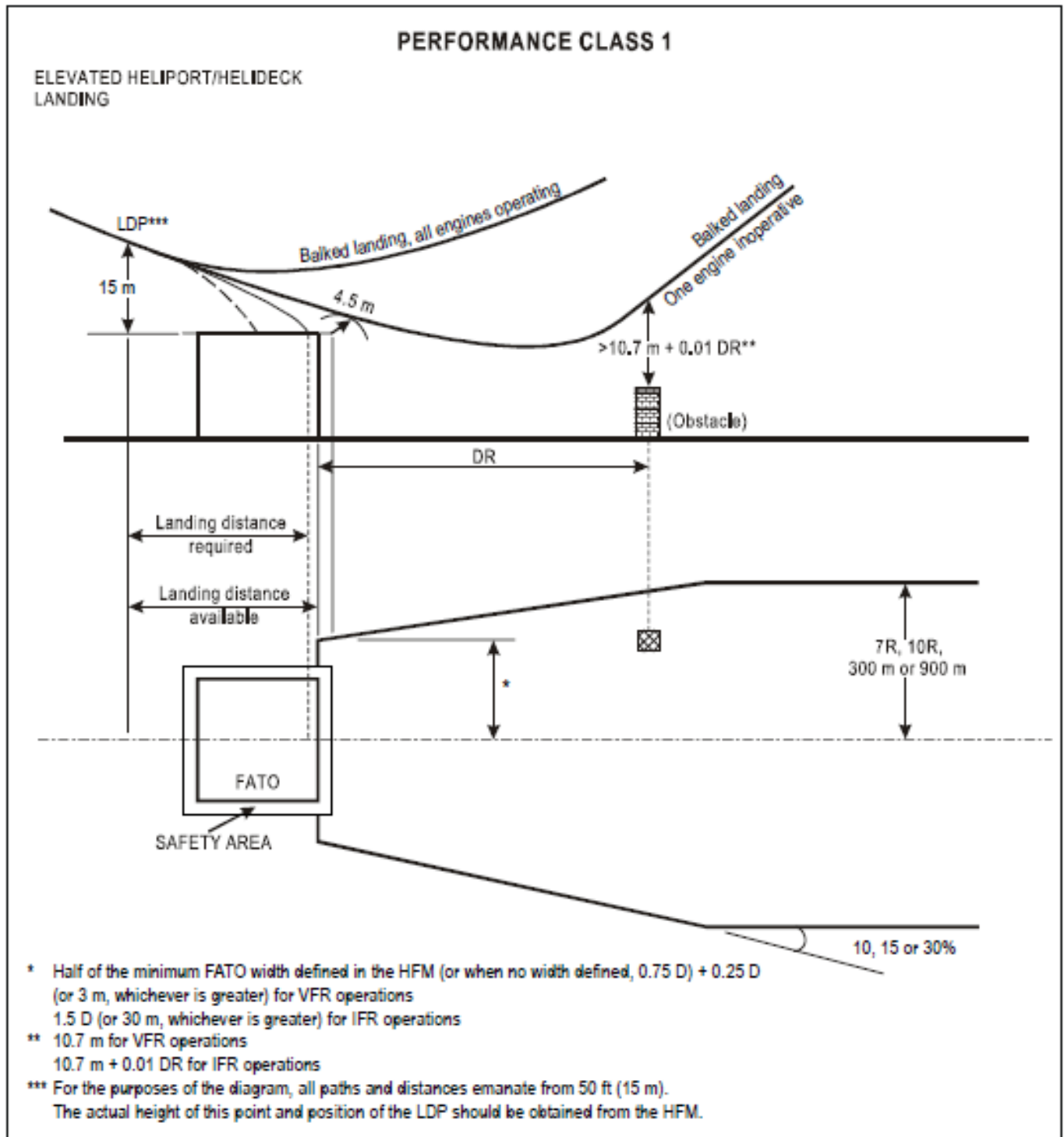


Figure 5

## 4.2 Operations in performance Class 2

### 4.2.1 Take-off (Figures 6 and 7)

The mass of the helicopter at take-off shall not exceed the maximum take-off mass specified in the flight manual for the procedures to be used and to achieve a rate of climb of 150 ft/min at 300 m (1 000 ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2.



#### 4.2.2 Take-off flight path

From DPATO or, as an alternative, no later than 60 m (200 ft) above the take-off surface with the critical engine inoperative, the conditions of 4.1.2.1 and 4.1.2.2 shall be met.

#### 4.2.3 En route

The requirements of 4.1.3 shall be met.

#### 4.2.4 Approach, landing and balked landing (Figures 8 and 9)

The estimated landing mass at the destination or alternate shall be such that:

- a) it does not exceed the maximum landing mass specified in the flight manual for a rate of climb of 150 ft/min at 300 m (1 000 ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2;
- b) it is possible, in case of the critical engine failure occurring at or before the DPBL, either to perform a safe forced landing or to overshoot, meeting the requirements of 4.1.2.1 and 4.1.2.2.

*Note: Only obstacles as specified in 2.4 should be considered.*

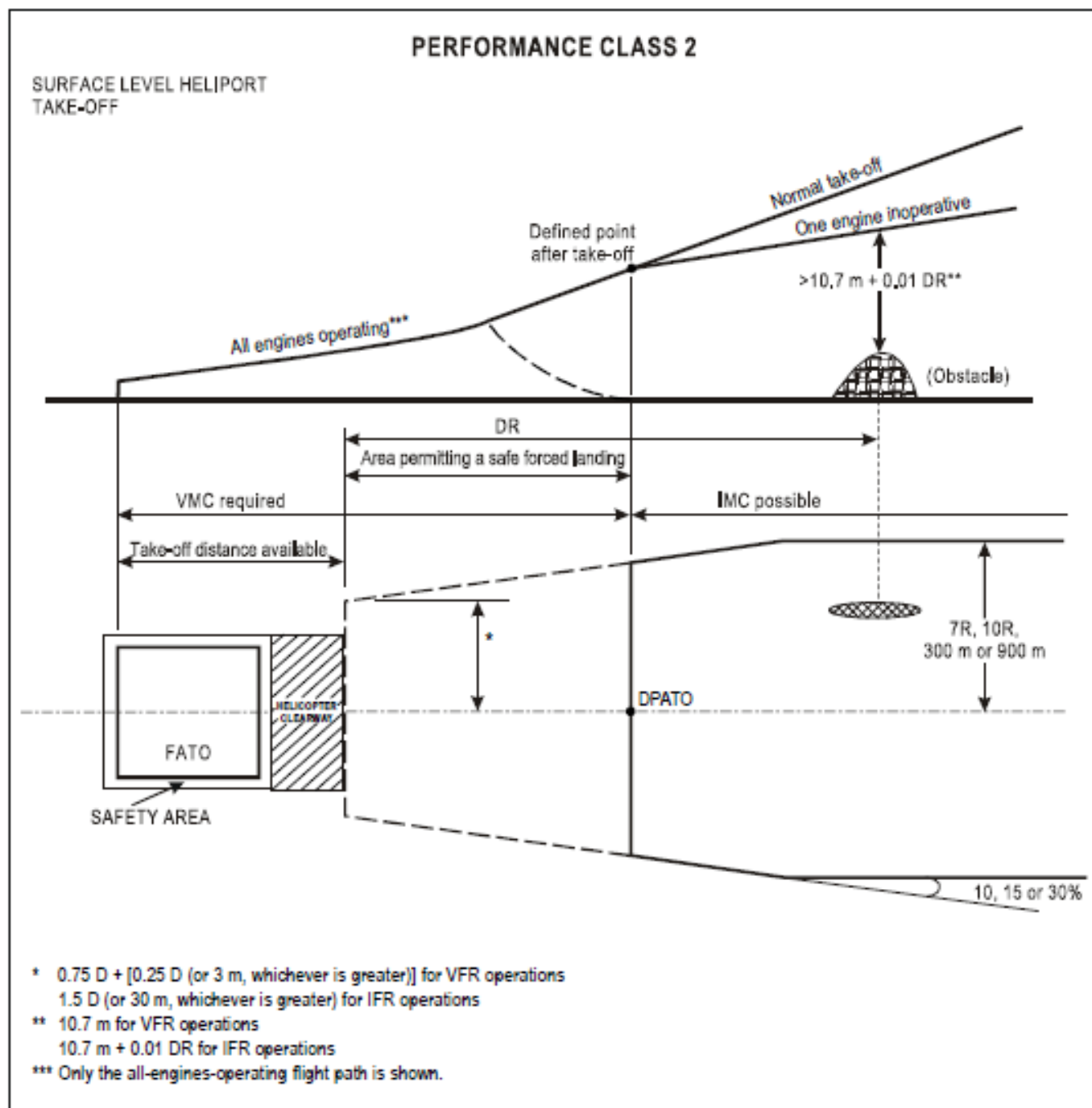


Figure 6

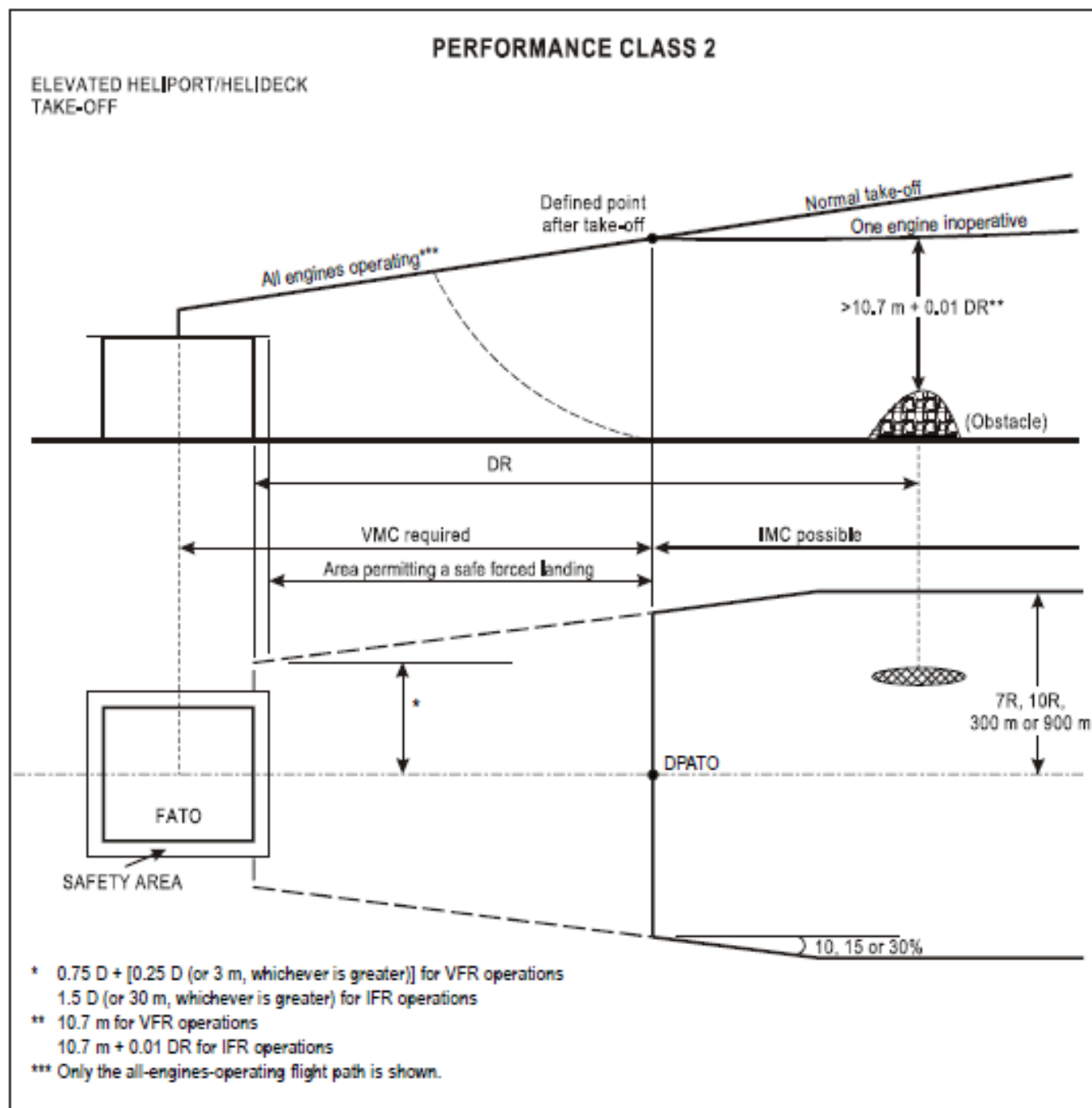


Figure 7

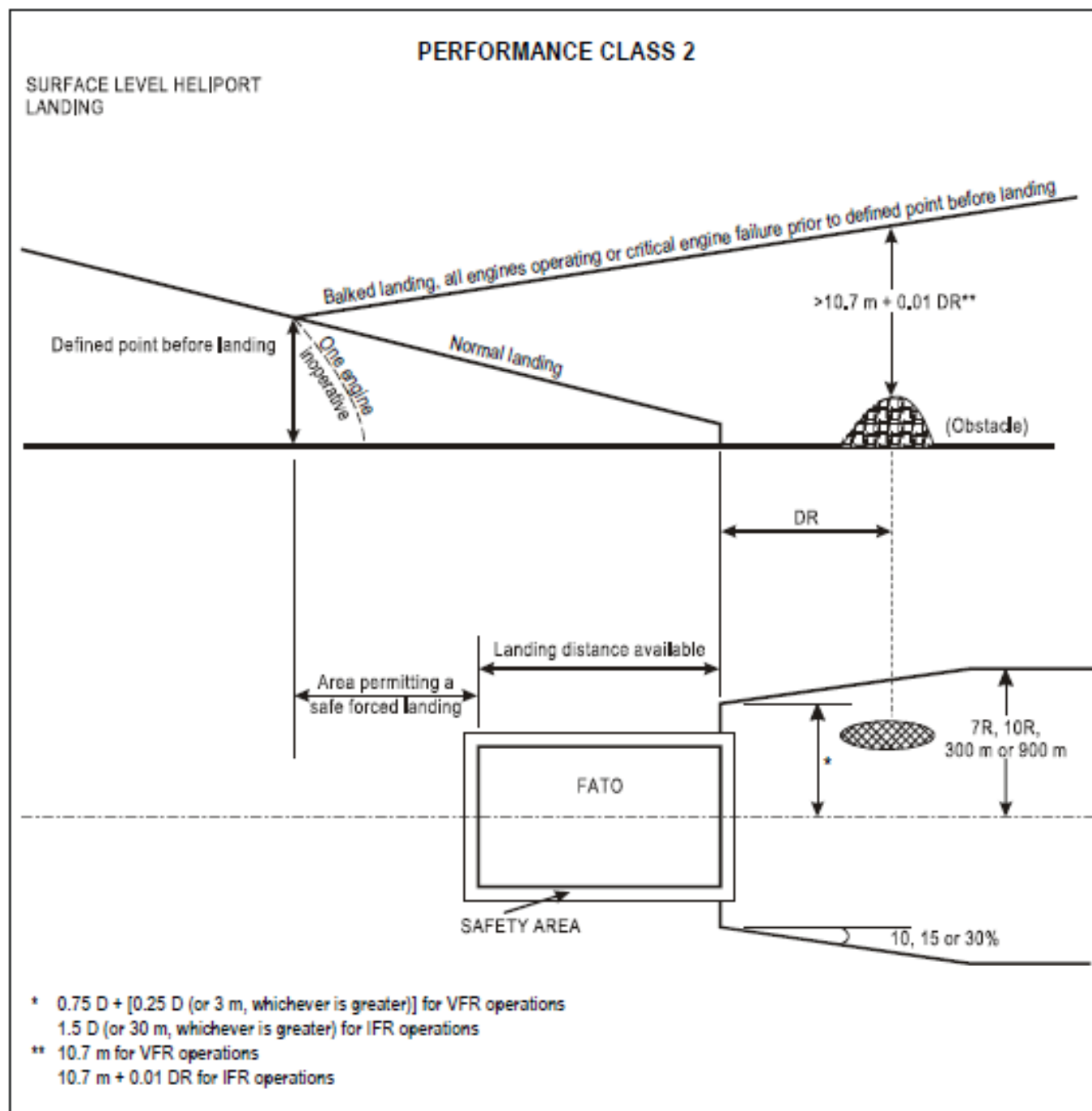


Figure 8

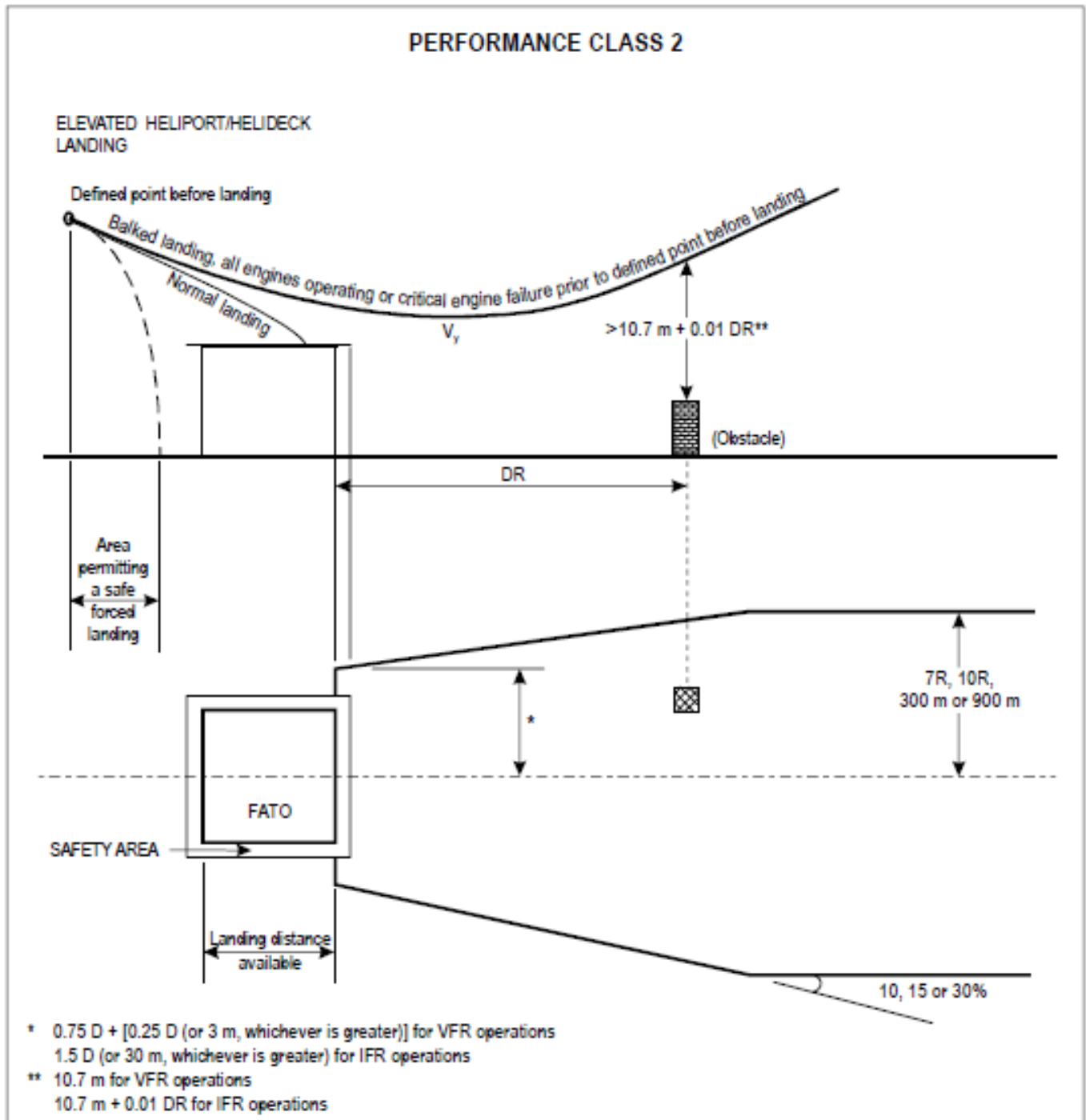


Figure 9

### 4.3 Operations in performance Class 3

#### 4.3.1 Take-off

The mass of the helicopter at take-off shall not exceed the maximum take-off mass specified in the flight manual for a hover in ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass shall not exceed the maximum mass specified for a hover out of ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2.



#### 4.3.2 Initial climb

The take-off mass shall be such that the climb path provides adequate vertical clearance above all obstacles located along the climb path, all engines operating.

#### 4.3.3 En route

The take-off mass is such that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating.

#### 4.3.4 Approach and landing

The estimated landing mass at the destination or alternate shall be such that:

- a) it does not exceed the maximum landing mass specified in the flight manual for a hover in ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass should not exceed the maximum mass specified for a hover out of ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2;
- b) it is possible to perform a balked landing, all engines operating, at any point of the flight path and clear all obstacles by an adequate vertical interval.

**SUBPART E****INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS****OPS 2H.401 General**

- (a) In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted. [The prescribed instruments and equipment, including their installation, shall be approved or accepted by the Authority as the State of Registry.
- (b) Instruments and equipment minimum performance standards are those prescribed in the applicable Technical Standard Orders (TSO) unless different performance standards are prescribed in the operational or airworthiness codes. Instruments and equipment complying with design and performance specifications other than TSO may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Instruments and equipment that have already been approved do not need to comply with a revised TSO or a revised specification, other than TSO, unless a retroactive requirement is prescribed.
- (c) A flight shall not be commenced when any of the helicopter's instruments, items of equipment or functions required for the intended flight are inoperative or missing, unless;
  - (1) the helicopter is operated in accordance with the MEL, if established; or
  - (2) the helicopter is subject to a permit to fly issued in accordance with the applicable airworthiness requirements.

**OPS 2H.402 Instruments and Equipment – General**

- (a) A helicopter shall be equipped with instruments which will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvres and observe the operating limitations of the helicopter in the expected operating conditions. A helicopter on all flights shall be equipped with or carry on board;
  - (1) an accessible first-aid kit (Refer to AMC OPS 1.745 to CAR OPS 1 for example of contents);
  - (2) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter. At least one shall be located in:
    - (i) the pilot's compartment; and
    - (ii) each passenger compartment that is separate from the pilot's compartment and not readily accessible to the pilot or co-pilot; and
    - (iii) [Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:
      - (A) meet the applicable requirements of the Authority as the State of Registry;



and

(B) not be of a type listed in Annex A, Group II of the *Montreal Protocol on Substances That Deplete the Ozone Layer*, 8th Edition, 2009.]

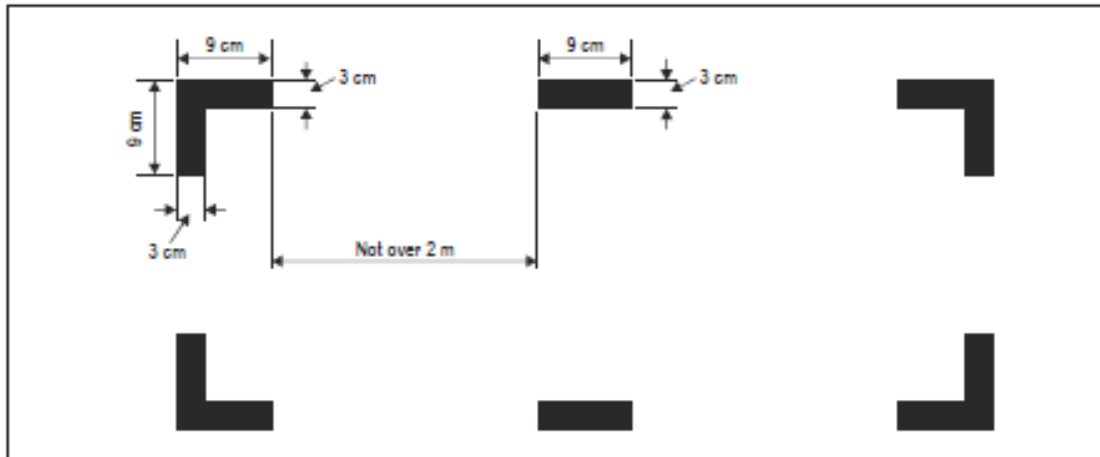
- (3)
  - (i) a seat or berth for each person who is aged 24 months or more; and
  - (ii) a seat belt for each seat and restraining belts for each berth;
- (4) the following manuals, charts and information:
  - (i) [the flight manual or other documents or information concerning any operating limitations prescribed for the helicopter by the Authority, as the State of Registry, required for the application of CAR OPS 2H, Chapter 3;]
  - (ii) any specific approval issued by the Authority under OPS 2H.106 for the operation(s) to be conducted.
  - (iii) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;
  - (iv) procedures, as prescribed in CAR OPS 0, for pilots-in-command of an intercepted helicopter;
  - (v) a list of visual signals for use by intercepting and intercepted helicopters, as contained in CAR OPS 0; and
  - (vi) the journey log book for the helicopter.
- (5) where the helicopter is fitted with fuses that are accessible in flight, spare electrical fuses of appropriate ratings for replacement of those fuses.
- (b) [Helicopters on all flights should be equipped with the ground-air signal codes for search and rescue purposes;]
- (c) Helicopters on all flights should be equipped with a safety harness for each flight crew member seat.

*Note: Safety harness includes shoulder strap(s) and a seat belt which may be used independently.]*

#### **OPS 2H.403 Marking of Break-in Points**

- (a) If areas of the fuselage suitable for break-in by rescue crews in emergency are marked on a helicopter such areas shall be marked as shown below (see figure following). The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background.
- (b) If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

*Note: This regulation does not require any helicopter to have break-in areas.*



#### OPS 2H.404 Instruments and Equipment - Day VFR

- (a) [All helicopters operated under VFR by day shall be;
- (1) equipped with a means of measuring and displaying the following;
    - (i) magnetic heading (standby compass),
    - (ii) barometric altitude,
    - (iii) indicated airspeed,
  - (2) equipped with, or shall carry, a means of measuring and displaying the time in hours, minutes and seconds.
  - (3) equipped with such additional equipment as may be prescribed by the Authority.
- (b) VFR flights, which are operated as controlled flights, should be equipped in accordance with OPS 2H.408.]

#### OPS 2H.406 Instruments and Equipment - Night VFR

All helicopters operated under VFR by night shall be equipped with;

- (a) the equipment specified in OPS 2H.404;
- (b) an attitude indicator (artificial horizon) for each required pilot;
- (c) a slip indicator;
- (d) [a means of measuring and displaying stabilised helicopter heading;
- (e) a means of measuring and displaying rate of climb and descent; and
- (f) such additional instruments and equipment as may be prescribed by the Authority.]

**OPS 2H.407 Operating Lights for Night Operations**

[(see Appendix 1 to OPS 2H.407)]

All helicopters operated at night in flight or operating on the movement area of an aerodrome or heliport shall be equipped with the following lights;]

- (a) an anti-collision light system;
- (b) navigation/position lights;
- (c) a landing light;

*Note: The landing light should be trainable, at least in the vertical plane.*

- (d) [illumination for all flight instruments and equipment that are essential for the safe operation of the helicopter that are used by the flight crew;]
- (e) lights in all passenger compartments; and
- (f) an independent portable light for each crew member station.

**OPS 2H.408 Instruments and Equipment - IFR**

All helicopters when operated in accordance with the instrument flight rules, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be;

- (a) [equipped with a means of measuring and displaying;
  - (1) magnetic heading (standby compass);
  - (2) barometric altitude;
  - (3) indicated airspeed, with a means of preventing malfunctioning due to either condensation or icing;
  - (3) rate of climb and descent
  - (4) slip;
  - (6) attitude indicator (artificial horizon) for each required pilot and one additional attitude indicator;
  - (7) stabilised helicopter heading;
  - (8) a means of indicating on the flight deck the outside air temperature;
- (b) equipped with, or shall carry, a means of measuring and displaying the time in hours, minutes and seconds.
- (c) equipped with a means of indicating when the supply of power to the gyroscopic instruments is adequate; and
- (d) equipped with such additional instruments or equipment as may be prescribed by the Authority.]

**OPS 2H.409 Flight Over Water – Emergency Equipment****(a) Means of flotation**

All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of flotation so as to ensure a safe ditching of the helicopter when:

- (1) engaged in offshore operations or other over-water operations as prescribed by the Authority, as the State of Registry; or
- (2) flying at a distance from land when;  
[ ]
  - (i) flying over water in a hostile environment at a distance from land corresponding to more than 10 minutes at normal cruise speed when operating in performance Class 1 or 2; or
  - (ii) flying over water in a non-hostile environment at a distance from land corresponding to more than 30 minutes at normal cruise speed when operating in performance Class 1; or
  - (iii) flying over water beyond autorotational or safe forced landing distance from land when operating in performance Class 3.

**(b) Emergency equipment**

Helicopters operating in accordance with the provisions of paragraph (a) above shall be equipped with:

- (1) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat of the person for whose use it is provided;
  - (2) when not precluded by consideration related to the type of helicopter used, life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken; and
  - (3) [equipment for making the pyrotechnical distress signals described in CAR OPS 0, Appendix 1.]
- (c) When taking off or landing at a heliport where, in the opinion of the Authority, as the State of Registry, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in paragraph (b) shall be carried.
- (d) Each life jacket and equivalent individual flotation device shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.
- (e) On any helicopter for which the individual certificate of airworthiness is first issued on or after 01 January 1991, at least 50 per cent of the life rafts carried should be deployable by remote control.
- (f) Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically assisted deployment.

**OPS 2H.412 Flights over Designated Land Areas**

Helicopters, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

**OPS 2H.413 High Altitude Flights**

- (a) [Helicopters intended to be operated at high altitudes shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required by OPS 2H.214.
- (b) Pressurised helicopters intended to be operated at flight altitudes at which the pressure altitude exceeds 10000 ft shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurisation.]

**OPS 2H.414 Noise Certification**

[All helicopters required to comply with the noise certification standards of CAR 21.210 shall carry a document attesting noise certification in the English language.]

*[Note: The various noise certification Standards of Annex 16, Volume I, which are applicable to helicopters, are determined according to the date of application for a Type Certificate, or the date of acceptance of an application under an equivalent prescribed procedure by the certifying authority. Some helicopters are not required to comply with any noise certification Standard. For details, see Annex 16, Volume I, Part II, Chapters 8 and 11.]*

**OPS 2H.416 Emergency Locator Transmitter (ELT)**

- (a) All helicopters operating in performance Class 1 and 2 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in OPS 2H.409(a)(1), with at least one automatic ELT and one ELT(S) in a raft or life jacket.
- (b) All helicopters operating in performance Class 3 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in OPS 2H.409(a)(2), with at least one automatic ELT and one ELT(S) in a raft or life jacket.
- (c) ELT equipment carried to satisfy the requirements shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

*Note 1: The judicious choice of numbers of ELTs, their type and placement on the helicopter and associated floatable life support systems will ensure the greatest chance of ELT activation in the event of an accident for helicopters operating over water or land, including areas especially difficult for search and rescue.*

*Note 2: Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.*

**OPS 2H.417 Pressure-Altitude Reporting Transponder**

- (a) Unless exempted by the appropriate authorities responsible for the airspace, all helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of ICAO Annex 10, Volume IV.
- (b) [All helicopters should be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.]

**OPS 2H.418 Microphones**

All flight crew members required to be on flight deck duty should communicate through boom or throat microphones.

**OPS 2H.419 Helicopters Equipped with ALS, HUD or Equivalent Displays, EVS, SVS and/or CVS**

- (a) [Notwithstanding OPS 2H.203(b), (c) and (d), where helicopters are equipped with automatic landing systems, a HUD and/or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, criteria for the use of such systems for the safe operation of the helicopter shall be established by the Authority.]
- (b) In establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the Authority shall require that:
  - (1) the equipment meets the appropriate airworthiness certification requirements;
  - (2) the operator/owner has carried out a safety risk assessment associated with the operations supported by the automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS;
  - (3) the operator/owner has established and documented the procedures for the use of, and training requirements for, automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS.

*Note: An automatic landing system for a helicopter is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.*

**OPS 2H.422 Electronic Flight Bags (EFB)**

- (a) EFB equipment

Where portable EFBs are used on board a helicopter, the pilot-in-command and the owner shall ensure that they do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter.

- (b) EFB functions

- (1) Where EFBs are used on board a helicopter the pilot-in-command and/or the owner shall:
  - (i) assess the safety risk(s) associated with each EFB function;



- (ii) establish the procedures for the use of, and training requirements for, the device and each EFB function; and
  - (iii) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.
- (c) The Authority, as State of the Registry, shall issue a specific approval for the operational use of EFB functions to be used for the safe operation of helicopters.
- (d) EFB specific approval

When issuing a specific approval for the operational use of EFBs, the State of Registry shall ensure that:

- (1) the EFB equipment and its associated installation hardware, including interaction with helicopter systems if applicable, meet the appropriate airworthiness certification requirements;
- (2) [the operator/owner has assessed the risks associated with the operations supported by the EFB function(s);
- (3) the operator/owner has established requirements for redundancy of the information (if appropriate) contained and displayed by the EFB function(s);
- (4) the operator/owner has established and documented procedures for the management of the EFB function(s) including any databases it may use; and
- (5) the operator/owner owner has established and documented the procedures for the use of, and training requirements for, the EFB function(s).]

#### **OPS 2H.423 Documents to be Carried**

Every helicopter engaged in international navigation shall carry the following documents;

- (a) Its certificate of registration;
- (b) Its certificate of airworthiness;
- (c) The appropriate licences, medical certificates and validations, if applicable, for each member of the crew;
- (d) Its journey log book;
- (e) [The Specific Approval, as required by OPS 2H.106.]
- (f) If it is equipped with radio apparatus, the helicopter radio station licence;
- (g) If it carries passengers, a list of their names and places of embarkation and destination; and
- (h) If it carries cargo, a manifest and detailed declarations of the cargo.
- (i) The original or a copy of the valid Insurance Certificate(s), which cover the aircraft, passengers and third-party liability clauses.



*Note 1: The procedures for the carriage of an electronic version of the documents listed in (a), (b) and (e) above must be acceptable to the Authority.*

*Note 2: There should be available on board the helicopter essential information concerning the search and rescue services in the areas over which it is intended the helicopter will be flown, including ground-air signal codes.*

*Note 3 The Certificate of Registration and Certificate of Airworthiness may be presented in digital format. The certificates, when issued by the Authority, are rendered valid as the original documents in their digital form. They satisfy the on-board carriage requirements for aircraft engaged in international air navigation in accordance with Articles 29 and 31 of the Convention on International Civil Aviation as well as the requirements of Annex 7 and 8 to the same Convention*

#### **OPS 2H.427 Cockpit Voice Recorders**

(See Appendix 1 to OPS 2H.427)

(See Appendix 1 to OPS 2H.427 to 2.433 inclusive)

(See Appendix 2 to OPS 2H.427 to 2.433 inclusive)

- (a) Helicopters with an MCTOM of more than 7000 kg shall be equipped with a CVR.
- (b) For helicopters not equipped with a FDR, at least main rotor speed shall be recorded on the CVR.
- (c) [All helicopters of a maximum certificated take-off mass of over 3175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least the main rotor speed should be recorded on the CVR.]
- (d) All helicopters required to be equipped with a CVR shall be equipped with a CVR which shall retain the information recorded during at least the last 2 hours of its operation.
- (e) CVRs and CARS shall not use magnetic tape or wire.

#### **OPS 2H.429 Flight Data Recorders**

(See Appendix 1 to OPS 2H.427 to 2.433 inclusive)

(See Appendix 2 to OPS 2H.427 to 2.433 inclusive)

(See Appendix 1 to OPS 2H.429)

(See Appendix 2 to OPS 2H.429)

(See Appendix 3 to OPS 2H.429)

(See Appendix 4 to OPS 2H.429)

- (a) Helicopters with a MCTOM of more than 7 000 kg, or having a passenger configuration of more than nineteen, and first issued with an individual C of A on or after 01 January 1989 shall be equipped with a FDR which shall record at least the parameters 1 – 30 listed in the Appendix 3 to OPS 2H.429 unless exempted under sub-paragraph (e) below.
- (b) Helicopters with a MCTOM of more than 3175 kg and first issued with an individual C of A on or after 01 January 2016 and having a passenger seating configuration, excluding any pilot seats of 10 or more, shall be equipped with a FDR shall be equipped with a FDR which shall record at least the parameters 1 – 48 listed in the Appendix 3 to OPS 2H.429 unless exempted under sub-paragraph (e) below.



- (c) FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

*Note: There is no requirement for helicopters to be fitted with ADRS. Only those helicopters equipped with ADRS need to refer to Appendix 4 to OPS 2H.429 regarding the parameters for ADRS.*

- (d) [All FDRs shall retain the information recorded during at least the last 10 hours of their operation.]
- (e) FDRs that meet the current parameter certification requirements of the FAA, Transport Canada or EASA in respect to private air transport operations shall be exempt from the parameter requirements of OPS 2H.429.
- (f) [The documentation requirement concerning FDR parameters provided by operators or owners to accident investigation authorities should be in electronic format and take account of industry specifications.]

#### **OPS 2H.431 Data Link Recording**

(See Appendix 1 to OPS 2H.431)

- (a) All helicopters for which the individual certificate of airworthiness is first issued on or after 01 January 2016, which use any of the data link communications applications referred to in Appendix 1 to OPS 2H.431 and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder.
- (b) All helicopters for which the individual certificate of airworthiness was first issued before 01 January 2016, that are required to carry a CVR and are modified on or after 01 January 2016 to install and utilize use any of the data link communications applications listed referred to in Appendix 1 to OPS 2H.431 shall record the data link communications messages on a crash-protected flight recorder unless the data link communications equipment is compliant with a type design or aircraft modification first approved prior to 01 January 2016.
- (c) The recorder shall use a digital method of recording and storing data and information and a method for readily retrieving that data. The recording method shall allow the data to match the data recorded on the ground and also be correlated to the recorded cockpit audio.
- (d) The minimum recording duration shall be equal to the duration of the CVR.
- (e) [Data link recording shall be able to be correlated to the recorded cockpit audio.]

*Note: The requirements applicable to the start and stop logic of the recorder are the same as the requirements applicable to the start and stop logic of the CVR contained in Appendix 1 to OPS 2H.427.]*

#### **OPS 2H.433 Combination Recorders**

*Note: [Combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements of this Subpart.]*



[Appendix 1 to OPS 2H.407  
**Lights To Be Displayed By Helicopters**  
(See OPS 2H.415)]

## 1. TERMINOLOGY

When the following terms are used in this Appendix, they have the following meanings:

***Angles of coverage.***

- (a) Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.
- (b) Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.
- (c) Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the helicopter, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.
- (d) Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the helicopter, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

***Horizontal plane.*** The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the helicopter.

***Longitudinal axis of the helicopter.*** A selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the helicopter.

***Making way.*** A helicopter on the surface of the water is “making way” when it is under way and has a velocity relative to the water.

***Under command.*** A helicopter on the surface of the water is “under command” when it is able to execute manoeuvres as required by the *International Regulations for Preventing Collisions at Sea* for the purpose of avoiding other vessels.

***Under way.*** A helicopter on the surface of the water is “under way” when it is not aground or moored to the ground or to any fixed object on the land or in the water.

***Vertical planes.*** Planes perpendicular to the horizontal plane.

***Visible.*** Visible on a dark night with a clear atmosphere.

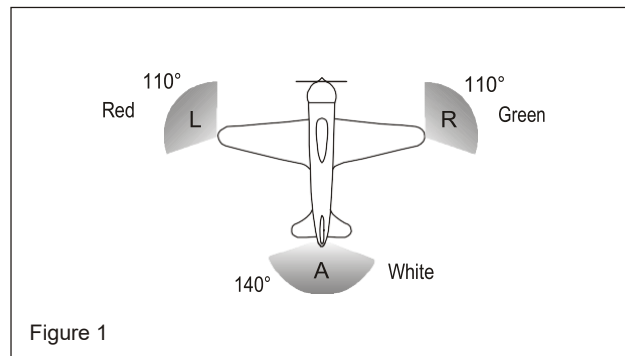
## 2. NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

- (a) a red light projected above and below the horizontal plane through angle of coverage L;
- (b) a green light projected above and below the horizontal plane through angle of coverage R;



- (c) a white light projected above and below the horizontal plane rearward through angle of coverage A.



### 3. LIGHTS TO BE DISPLAYED ON THE WATER

#### 3.1 General

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following circumstances:

- (a) when under way;
- (b) when towing another vessel or aircraft;
- (c) when being towed;
- (d) when not under command and not making way;
- (e) when making way but not under command;
- (f) when at anchor;
- (g) when aground.

The lights required by helicopters in each case are described below.

#### 3.2 When under way

As illustrated in Figure 2, the following appearing as steady, unobstructed lights:

- (a) a red light projected above and below the horizontal through angle of coverage L;
- (b) a green light projected above and below the horizontal through angle of coverage R;
- (c) a white light projected above and below the horizontal through angle of coverage A; and
- (d) a white light projected through angle of coverage F.

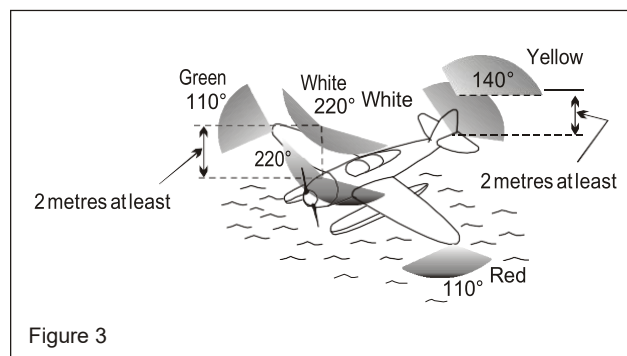
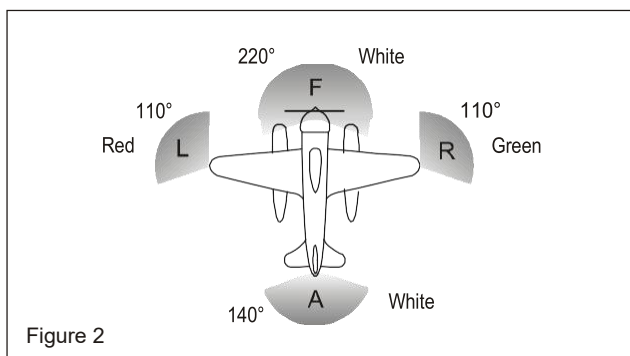
The lights described in (a), (b) and (c) should be visible at a distance of at least 3.7 km (2 NM). The light described in (d) should be visible at a distance of 9.3 km (5 NM) when fitted to a helicopter of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to a helicopter of less than 20 m in length.



### 3.3 When towing another vessel or aircraft

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

- (a) the lights described in 3.2;
- (b) a second light having the same characteristics as the light described in 3.2 (d) and mounted in a vertical line at least 2 m above or below it; and
- (c) a yellow light having otherwise the same characteristics as the light described in 3.2 (c) and mounted in a vertical line at least 2 m above it.



### 3.4 When being towed

The lights described in 3.2 (a), (b) and (c) appearing as steady, unobstructed lights.

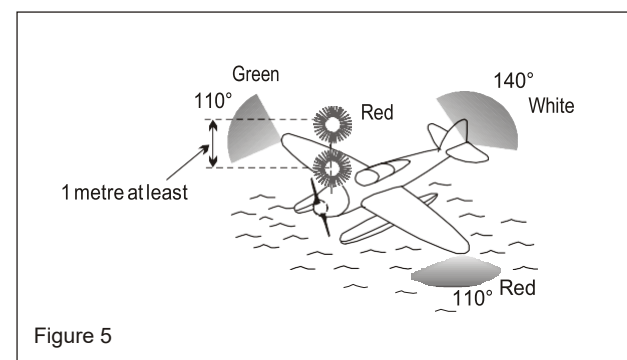
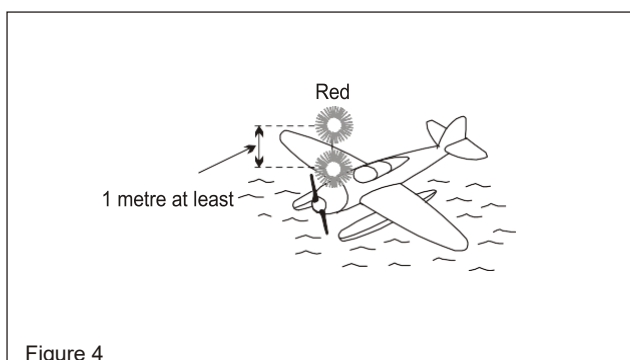
### 3.5 When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

### 3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 (a), (b) and (c).

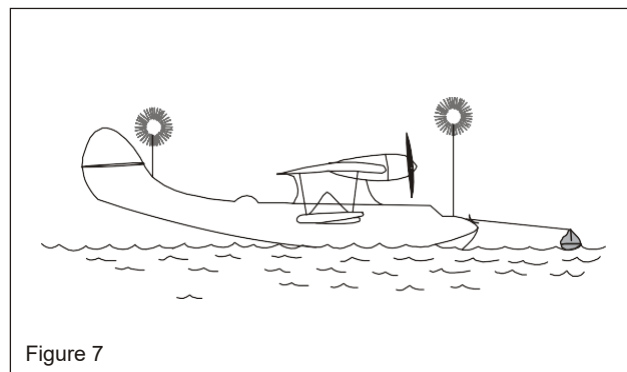
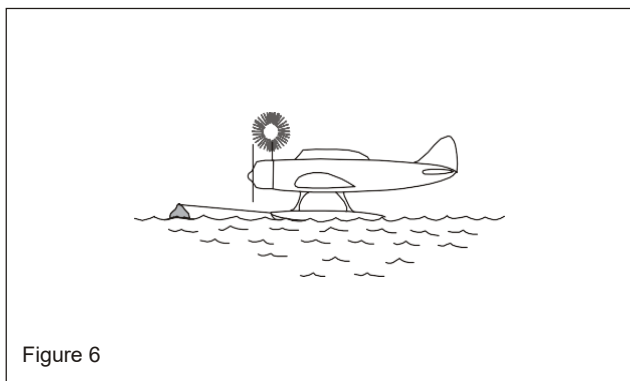
*Note: The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the helicopter showing them is not under command and cannot therefore get out of the way. They are not signals of helicopters in distress and requiring assistance.*





### 3.7 When at anchor

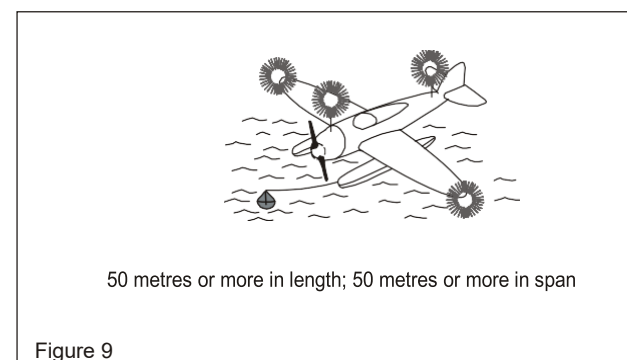
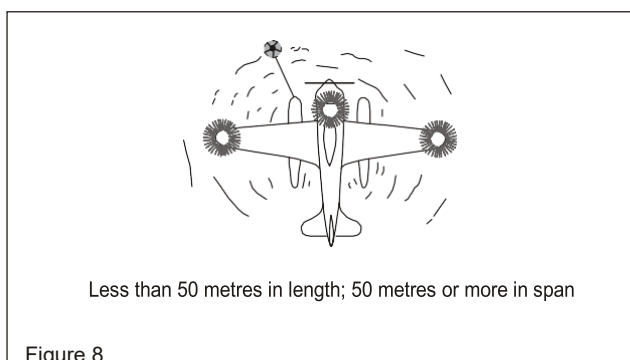
- (a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).
- (b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).



- (c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).

### 3.8 When aground

The lights prescribed in 3.7 and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon.



]

**Appendix 1 to OPS 2H.427****Cockpit Voice Recorder (CVR) and Cockpit Audio Recording System (CARS)**

(See OPS 2H.427)

**(a) Start and stop logic**

The CVR or CARS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

**(b) Signals to be recorded**

(1) The CVR shall record simultaneously on four separate channels, or more, at least the following:

- (i) voice communication transmitted from or received in the helicopter by radio;
- (ii) aural environment on the flight deck;
- (iii) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed;
- (iv) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker;
- (v) voice communications of flight crew members using the passenger address system, if installed

**(c) The preferred CVR audio allocation should be as follows:**

- (1) pilot-in-command audio panel;
- (2) co-pilot audio panel;
- (3) additional flight crew positions and time reference; and
- (4) cockpit area microphone.

**(d) The CARS shall record simultaneously on two separate channels, or more, at least the following:**

- (1) voice communication transmitted from or received in the helicopter by radio;
- (2) aural environment on the flight deck; and
- (3) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed.

**(e) The preferred CARS audio allocation should be as follows:**

- (1) voice communication; and



- (2) aural environment on the flight deck.



**Appendix 1 to OPS 2H.427 to OPS 2H.433 Inclusive**  
**Flight Recorders – General**  
(See OPS 2H.427 to OPS 2H.433)

*Note 1: The following applies to all crash protected flight recorders which comprise one or more of the following:*

- (1) a flight data recorder (FDR),*
- (2) a cockpit voice recorder (CVR)*
- (3) an airborne image recorder (AIR),*
- (4) a data link recorder (DLR).*

*When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.*

*Note 2: [For helicopters, combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements.]*

*Note 3: Lightweight flight recorders, which comprise one or more of the following:*

- (1) an aircraft data recording system (ADRS),*
- (2) a cockpit audio recording system (CARS),*
- (3) an airborne image recording system (AIRS)*
- (4) a data link recording system (DLRS).*

*When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS.*

- (a) Non-deployable flight recorder containers shall be painted a distinctive orange colour;
- (b) Non-deployable crash protected flight recorder containers shall;
  - (1) carry reflective material to facilitate their location; and
  - (2) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz that operates for a minimum of 90 days.
- (c) Automatic deployable flight recorder containers shall:
  - (1) be painted a distinctive orange colour, however the surface visible from outside the helicopter may be of another colour;
  - (2) carry reflective material to facilitate their location; and
  - (3) have an integrated automatically activated ELT.
- (d) The flight recorder systems shall be installed so that:



- (1) the probability of damage to the recordings is minimised;
- (2) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and
- (3) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and
- (4) for helicopters for which the individual certificate of airworthiness is first issued on or after 01 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimised.

*Note: The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialised replay or copying techniques.*

- (e) The crash protected flight recorder systems shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardising service to essential or emergency loads.
- (f) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.
- (g) The flight recorder systems, when tested by methods approved by the appropriate certifying authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.
- (h) [Means shall be provided for an accurate time correlation between the flight recorder systems recordings.]
- (i) The flight recorder system manufacturer shall provide the appropriate certifying authority with the following information in respect of the flight recorder systems:
  - (1) manufacturer's operating instructions, equipment limitations and installation procedures;
  - (2) parameter origin or source and equations which relate counts to units of measurement;
  - (3) manufacturer's test reports; and
  - (4) detailed information to ensure the continued serviceability of the flight recorder system.
- (j) The holder of the airworthiness approval for the installation design of the flight recorder system shall make available the relevant continuing airworthiness information to the operator of the helicopter to be incorporated in the continuing airworthiness maintenance programme. This continuing airworthiness information shall cover in detail all the tasks required to ensure the continued serviceability of the flight recorder system.

*Note: The flight recorder system is composed of the flight recorder as well as any dedicated sensors, hardware and software that provide information required by this Appendix.*



- (k) [Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.
- (l) Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.]
- (m) Flight recorders shall not be switched off during flight time.
- (n) To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined by the investigating authority.
- (o) The pilot-in-command, and/or the owner/operator, or in the case where it is leased, the lessee, shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined by the investigating authority.
- (p) Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.



**Appendix 2 to OPS 2H.427 to OPS 2H.433 Inclusive**  
**Inspection of Flight Recorder Systems**  
(See OPS 2H.427 to OPS 2H.433)

- (a) Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.
- (b) FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year. This period may be extended by the Authority to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring.
- (c) DLR systems or DLRS shall have recording inspection intervals of two years. This period may be extended by the Authority to four years provided these systems have demonstrated a high integrity of serviceability and self-monitoring.
- (d) Recording inspections shall be carried out as follows:
  - (1) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
  - (2) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the helicopter's electrical bus system need not be checked if their serviceability can be detected by other helicopter systems;
  - (3) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
  - (4) an annual examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the helicopter, the CVR or CARS shall record test signals from each helicopter source and from relevant external sources to ensure that all required signals meet intelligibility standards;
  - (5) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and
  - (6) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the helicopter, the AIR or AIRS shall record test images from each helicopter source and from relevant external sources to ensure that all required images meet recording quality standards.
  - (7) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.
- (e) A flight recorder system shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.
- (f) A report of the recording inspection shall be made available on request to regulatory authorities for monitoring purposes.



- (g) Calibration of the FDR system:
- (1) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every five years. The recalibration shall determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and
  - (2) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every two years.

**Appendix 1 to OPS 2H.429****Flight Data Recorder (FDR) and Aircraft Data Recording Systems (ADRS)**

(See OPS 2H.429)

**(a) Start and Stop Logic**

The FDR or ADRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power.

**(b) Parameters to be Recorded**

- (1) The parameters that satisfy the requirements for FDRs are listed in the paragraphs below in Appendix 3 to OPS 2H.429. [The parameters without an asterisk (\*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an asterisk (\*) shall be recorded if an information data source for the parameter is used by helicopter systems and is practicable to record.]
- (2) The following parameters shall satisfy the requirements for flight path and speed;
  - Pressure altitude
  - [Indicated airspeed
  - Outside air temperature
  - Heading
  - Normal acceleration
  - Lateral acceleration
  - Longitudinal acceleration (body axis)
  - Time or relative time count]
  - Navigation data\*: drift angle, wind speed, wind direction, latitude/longitude
  - Radio altitude\*
- (3) If further FDR recording capacity is available, recording of the following additional information shall be considered:
  - (i) operational information from electronic displays, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS).
  - (ii) additional engine parameters (EPR, N<sub>1</sub>, fuel flow etc.)
- (4) The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Appendix 4 to OPS 2H.429.
- (5) If further ADRS recording capacity is available, the recording of any parameters from 8 onwards listed in Appendix 4 to OPS 2H.429 shall be considered.

*Note: There is no requirement for helicopters to be equipped with ADRS. Only those helicopters equipped with ADRS need to refer to Appendix 4 to OPS 2H.429 regarding the parameters for ADRS.*

**(c) Additional Information**



- (1) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.
- (2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

**Appendix 2 to OPS 2H.429****Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS)**

(See OPS 2H.429)

**(a) Start and Stop Logic**

The AIR or AIRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

**(b) Classes**

- (1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

*Note 1: To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

*Note 2: There are no provisions for Class A AIR or AIRS in this document.*

- (2) A Class B AIR or AIRS captures data link message displays.
- (3) A Class C AIR or AIRS captures instruments and control panels.

*Note: A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.*



**Appendix 3 to OPS 2H.429**  
**Parameter Characteristics for Flight Data Recorders**  
 (See OPS 2H.429)

| Serial number | Parameter                                                                  | Applicability | Measurement range                                                                    | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout)    | Recording resolution |
|---------------|----------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------|----------------------|
| 1             | Time (UTC when available, otherwise relative time count or GNSS time sync) |               | 24 hours                                                                             | 4                                                 | $\pm 0.125\%/h$                                           | 1 s                  |
| 2             | Pressure altitude                                                          |               | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1                                                 | $\pm 30$ m to $\pm 200$ m ( $\pm 100$ ft to $\pm 700$ ft) | 1.5 m (5 ft)         |
| 3             | Indicated airspeed                                                         |               | As the installed pilot display measuring system                                      | 1                                                 | $\pm 3\%$                                                 | 1 kt                 |
| 4             | Heading                                                                    |               | 360°                                                                                 | 1                                                 | $\pm 2^\circ$                                             | 0.5°                 |



| Serial number | Parameter                                                                                                                                               | Applicability | Measurement range                                  | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution            |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------|---------------------------------------------------|--------------------------------------------------------|---------------------------------|
| 5             | Normal acceleration                                                                                                                                     |               | -3 g to +6 g                                       | 0.125                                             | ±0.09 g excluding a datum error of ±0.045 g            | 0.004 g                         |
| 6             | Pitch attitude                                                                                                                                          |               | ±75° or 100% of useable range whichever is greater | 0.5                                               | ±2°                                                    | 0.5°                            |
| 7             | Roll attitude                                                                                                                                           |               | ±180°                                              | 0.5                                               | ±2°                                                    | 0.5°                            |
| 8             | Radio transmission keying                                                                                                                               |               | On-off (one discrete)                              | 1                                                 | —                                                      | —                               |
| 9             | Power on each engine                                                                                                                                    |               | Full range                                         | 1 (per engine)                                    | ±2%                                                    | 0.1% of full range              |
| 10            | Main rotor:                                                                                                                                             |               |                                                    |                                                   |                                                        |                                 |
|               | Main rotor speed                                                                                                                                        |               | 50–130%                                            | 0.51                                              | ±2%                                                    | 0.3% of full range              |
|               | Rotor brake                                                                                                                                             |               | Discrete                                           |                                                   | —                                                      | —                               |
| 11            | Pilot input and/or control surface position<br>– primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) |               | Full range                                         | 0.5<br>(0.25 recommended)                         | ±2% unless higher accuracy uniquely required           | 0.5% of operating range         |
| 12            | Hydraulics, each system (low pressure and selection)                                                                                                    |               | Discrete                                           | 1                                                 | —                                                      | —                               |
| 13            | Outside air temperature                                                                                                                                 |               | Sensor range                                       | 2                                                 | ±2°C                                                   | 0.3°C                           |
| 14*           | Autopilot/ autothrottle/ AFCS mode and engagement status                                                                                                |               | A suitable combination of discretes                | 1                                                 | —                                                      | —                               |
| 15*           | Stability augmentation system engagement                                                                                                                |               | Discrete                                           | 1                                                 | —                                                      | —                               |
| 16*           | Main gearbox oil pressure                                                                                                                               |               | As installed                                       | 1                                                 | As installed                                           | 6.895 kN/m <sup>2</sup> (1 psi) |
| 17*           | Main gearbox oil temperature                                                                                                                            |               | As installed                                       | 2                                                 | As installed                                           | 1°C                             |
| 18            | Yaw rate                                                                                                                                                |               | ±400°/second                                       | 0.25                                              | ±1.5% maximum range excluding datum error of ±5%       | ±2°/s                           |



| Serial number | Parameter                                                                                   | Applicability | Measurement range                          | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout)                                       | Recording resolution                                                                      |
|---------------|---------------------------------------------------------------------------------------------|---------------|--------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 19*           | Sling load force                                                                            |               | 0 to 200% of certified load                | 0.5                                               | ±3% of maximum range                                                                         | 0.5% for maximum certified load                                                           |
| 20            | Longitudinal acceleration                                                                   |               | ±1 g                                       | 0.25                                              | ±0.015 g excluding a datum error of ±0.05 g                                                  | 0.004 g                                                                                   |
| 21            | Lateral acceleration                                                                        |               | ±1 g                                       | 0.25                                              | ±0.015 g excluding a datum error of ±0.05 g                                                  | 0.004 g                                                                                   |
| 22*           | Radio altitude                                                                              |               | −6 m to 750 m<br>(−20 ft to 2 500 ft)      | 1                                                 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 23*           | Vertical beam deviation                                                                     |               | Signal range                               | 1                                                 | ±3%                                                                                          | 0.3% of full range                                                                        |
| 24*           | Horizontal beam deviation                                                                   |               | Signal range                               | 1                                                 | ±3%                                                                                          | 0.3% of full range                                                                        |
| 25            | Marker beacon passage                                                                       |               | Discrete                                   | 1                                                 | —                                                                                            | —                                                                                         |
| 26            | Warnings                                                                                    |               | Discrete(s)                                | 1                                                 | —                                                                                            | —                                                                                         |
| 27            | Each navigation receiver frequency selection                                                |               | Sufficient to determine selected frequency | 4                                                 | As installed                                                                                 | —                                                                                         |
| 28*           | DME 1 and 2 distances                                                                       |               | 0–370 km<br>(0–200 NM)                     | 4                                                 | As installed                                                                                 | 1 852 m (1 NM)                                                                            |
| 29*           | Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction) |               | As installed                               | 2                                                 | As installed                                                                                 | As installed                                                                              |
| 30*           | Landing gear and gear selector position                                                     |               | Discrete                                   | 4                                                 | —                                                                                            | —                                                                                         |
| 31*           | Engine exhaust gas temperature (T4)                                                         |               | As installed                               | 1                                                 | As installed                                                                                 |                                                                                           |
| 32*           | Turbine inlet temperature (TIT/ITT)                                                         |               | As installed                               | 1                                                 | As installed                                                                                 |                                                                                           |
| 33*           | Fuel contents                                                                               |               | As installed                               | 4                                                 | As installed                                                                                 |                                                                                           |



| Serial number | Parameter                                                         | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution                   |
|---------------|-------------------------------------------------------------------|---------------|-------------------|---------------------------------------------------|--------------------------------------------------------|----------------------------------------|
| 34*           | Altitude rate                                                     |               | As installed      | 1                                                 | As installed                                           |                                        |
| 35*           | Ice detection                                                     |               | As installed      | 4                                                 | As installed                                           |                                        |
| 36*           | Helicopter health and usage monitor system                        |               | As installed      | —                                                 | As installed                                           | —                                      |
| 37            | Engine control modes                                              |               | Discrete          | 1                                                 | —                                                      | —                                      |
| 38*           | Selected barometric setting (pilot and co-pilot)                  |               | As installed      | 64<br>(4 recommended)                             | As installed                                           | 0.1 mb<br>(0.003 in Hg)                |
| 39*           | Selected altitude (all pilot selectable modes of operation)       |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 40*           | Selected speed (all pilot selectable modes of operation)          |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 41*           | Selected Mach (all pilot selectable modes of operation)           |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 42*           | Selected vertical speed (all pilot selectable modes of operation) |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 43*           | Selected heading (all pilot selectable modes of operation)        |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 44*           | Selected flight path (all pilot selectable modes of operation)    |               | As installed      | 1                                                 | As installed                                           | Sufficient to determine crew selection |
| 45*           | Selected decision height                                          |               | As installed      | 4                                                 | As installed                                           | Sufficient to determine crew selection |
| 46*           | EFIS display format (pilot and co-pilot)                          |               | Discrete(s)       | 4                                                 | —                                                      | —                                      |
| 47*           | Multi-function/engine/alerts display format                       |               | Discrete(s)       | 4                                                 | —                                                      | —                                      |
| 48*           | Event marker                                                      |               | Discrete          | 1                                                 | —                                                      | —                                      |



| Serial number | Parameter                                                                                                                                                                                                        | Applicability                                                                                     | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------|--------------------------------------------------------|-------------------------|
| 49*           | GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) and (operational status) | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s)       | 1                                                 | As installed                                           |                         |
| 50*           | TCAS/ACAS (traffic alert and collision avoidance system) and (operational status)                                                                                                                                | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s)       | 1                                                 | As installed                                           |                         |
| 51*           | Primary flight controls – pilot input forces                                                                                                                                                                     | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Full range        | 0.125 (0.0625 recommended)                        | ± 3% unless higher accuracy is uniquely required       | 0.5% of operating range |
| 52*           | Computed centre of gravity                                                                                                                                                                                       | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed      | 64                                                | As installed                                           | 1% of full range        |
| 53*           | Helicopter computed weight                                                                                                                                                                                       | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed      | 64                                                | As installed                                           | 1% of full range        |



# Appendix 4 to OPS 2H.429

## Parameter Characteristics for Aircraft Data Recording Systems (ADRS)

(See OPS 2H.429)

| N° | Parameter name                | Minimum recording range  | Maximum recording interval in seconds | Minimum recording accuracy                      | Minimum recording resolution | Remarks                                                                      |
|----|-------------------------------|--------------------------|---------------------------------------|-------------------------------------------------|------------------------------|------------------------------------------------------------------------------|
| 1  | Heading:                      |                          |                                       |                                                 |                              |                                                                              |
|    | a) Heading (Magnetic or True) | $\pm 180^\circ$          | 1                                     | $\pm 2^\circ$                                   | $0.5^\circ$                  | *Heading is preferred, if not available, yaw rate shall be recorded          |
|    | b) Yaw rate                   | $\pm 300^\circ/\text{s}$ | 0.25                                  | $\pm 1\% + \text{drift of } 360^\circ/\text{h}$ | $2^\circ/\text{s}$           |                                                                              |
| 2  | Pitch:                        |                          |                                       |                                                 |                              |                                                                              |
|    | a) Pitch attitude             | $\pm 90^\circ$           | 0.25                                  | $\pm 2^\circ$                                   | $0.5^\circ$                  | *Pitch attitude is preferred, if not available, pitch rate shall be recorded |
|    | b) Pitch rate                 | $\pm 300^\circ/\text{s}$ | 0.25                                  | $\pm 1\% + \text{drift of } 360^\circ/\text{h}$ | $2^\circ/\text{s}$           |                                                                              |
| 3  | Roll:                         |                          |                                       |                                                 |                              |                                                                              |
|    | a) Roll attitude              | $\pm 180^\circ$          | 0.25                                  | $\pm 2^\circ$                                   | $0.5^\circ$                  | *Roll attitude is preferred, if not available, roll rate shall be recorded   |



| N° | Parameter name            | Minimum recording range                                                             | Maximum recording interval in seconds | Minimum recording accuracy                                                | Minimum recording resolution | Remarks                                |
|----|---------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------|------------------------------|----------------------------------------|
|    | b) Roll rate              | ±300°/s                                                                             | 0.25                                  | ±1% + drift of 360°/h                                                     | 2°/s                         |                                        |
| 4  | Positioning system:       |                                                                                     |                                       |                                                                           |                              |                                        |
|    | a) Time                   | 24 hours                                                                            | 1                                     | ±0.5°                                                                     | 0.1°                         | UTC time preferred where available     |
|    | b) Latitude/longitude     | Latitude: ±90°<br>Longitude: ±180°                                                  | 2<br>(1 if available)                 | As installed<br>(0.00015° recommended)                                    | 0.00005°                     |                                        |
|    | c) Altitude               | −300 m (−1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft) | 2<br>(1 if available)                 | As installed<br>(±15 m (±50 ft) recommended)                              | 1.5 m (5 ft)                 |                                        |
|    | d) Ground speed           | 0–1 000 kt                                                                          | 2<br>(1 if available)                 | As installed<br>(±5 kt recommended)                                       | 1 kt                         |                                        |
|    | e) Track                  | 0–360°                                                                              | 2<br>(1 if available)                 | As installed<br>(± 2° recommended)                                        | 0.5°                         |                                        |
|    | f) Estimated error        | Available range                                                                     | 2<br>(1 if available)                 | As installed                                                              | As installed                 | Shall be recorded if readily available |
| 5  | Normal acceleration       | −3 g to + 6 g                                                                       | 0.25<br>(0.125 if available)          | As installed<br>(±0.09 g excluding a datum error of ±0.05 g recommended)  | 0.004 g                      |                                        |
| 6  | Longitudinal acceleration | ±1 g                                                                                | 0.25<br>(0.125 if available)          | As installed<br>(±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g                      |                                        |
| 7  | Lateral acceleration      | ±1 g                                                                                | 0.25<br>(0.125 if available)          | As installed<br>(±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g                      |                                        |



| N° | Parameter name                                     | Minimum recording range                                                   | Maximum recording interval in seconds | Minimum recording accuracy                                                                                      | Minimum recording resolution         | Remarks                         |
|----|----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| 8  | External static pressure (or pressure altitude)    | 34.4 mb (1.02 in-Hg) to 310.2 mb (9.16 in-Hg) or available sensor range   | 1                                     | As installed ( $\pm 1$ mb (0.3 in-Hg) or $\pm 30$ m ( $\pm 100$ ft) to $\pm 210$ m ( $\pm 700$ ft) recommended) | 0.1 mb (0.003 in-Hg) or 1.5 m (5 ft) |                                 |
| 9  | Outside air temperature (or total air temperature) | $-50^{\circ}$ to $+90^{\circ}\text{C}$ or available sensor range          | 2                                     | As installed ( $\pm 2^{\circ}\text{C}$ recommended)                                                             | $1^{\circ}\text{C}$                  |                                 |
| 10 | Indicated air speed                                | As the installed pilot display measuring system or available sensor range | 1                                     | As installed ( $\pm 3\%$ recommended)                                                                           | 1 kt (0.5 kt recommended)            |                                 |
| 11 | Main rotor speed (Nr)                              | 50% to 130% or available sensor range                                     | 0.5                                   | As installed                                                                                                    | 0.3% of full range                   |                                 |
| 12 | Engine RPM (*)                                     | Full range including overspeed condition                                  | Each engine each second               | As installed                                                                                                    | 0.2% of full range                   | *For piston-engined helicopters |
| 13 | Engine oil pressure                                | Full range                                                                | Each engine each second               | As installed (5% of full range recommended)                                                                     | 2% of full range                     |                                 |
| 14 | Engine oil temperature                             | Full range                                                                | Each engine each second               | As installed (5% of full range recommended)                                                                     | 2% of full range                     |                                 |
| 15 | Fuel flow or pressure                              | Full range                                                                | Each engine each second               | As installed                                                                                                    | 2% of full range                     |                                 |
| 16 | Manifold pressure (*)                              | Full range                                                                | Each engine each second               | As installed                                                                                                    | 0.2% of full range                   | *For piston-engined helicopters |



| Nº | Parameter name                                                                       | Minimum recording range              | Maximum recording interval in seconds | Minimum recording accuracy                          | Minimum recording resolution | Remarks                                                                                                                                                                                                                         |
|----|--------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------|-----------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range                           | Each engine each second               | As installed                                        | 0.1% of full range           | *Sufficient parameters for example, EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine-engined helicopters. |
| 18 | Engine gas generator speed (Ng) (*)                                                  | 0–150%                               | Each engine each second               | As installed                                        | 0.2% of full range           | *Only for turbine-engined helicopters                                                                                                                                                                                           |
| 19 | Free power turbine speed (Nf) (*)                                                    | 0–150%                               | Each engine each second               | As installed                                        | 0.2% of full range           | *Only for turbine-engined helicopters                                                                                                                                                                                           |
| 20 | Collective pitch                                                                     | Full range                           | 0.5                                   | As installed                                        | 0.1% of full range           |                                                                                                                                                                                                                                 |
| 21 | Coolant temperature (*)                                                              | Full range                           | 1                                     | As installed ( $\pm 5^{\circ}\text{C}$ recommended) | 1° C                         | *Only for piston-engined helicopters                                                                                                                                                                                            |
| 22 | Main voltage                                                                         | Full range                           | Each engine each second               | As installed                                        | 1 Volt                       |                                                                                                                                                                                                                                 |
| 23 | Cylinder head temperature (*)                                                        | Full range                           | Each cylinder each second             | As installed                                        | 2% of full range             | *Only for piston-engined helicopters                                                                                                                                                                                            |
| 24 | Fuel quantity                                                                        | Full range                           | 4                                     | As installed                                        | 1% of full range             |                                                                                                                                                                                                                                 |
| 25 | Exhaust gas temperature                                                              | Full range                           | Each engine each second               | As installed                                        | 2% of full range             |                                                                                                                                                                                                                                 |
| 26 | Emergency voltage                                                                    | Full range                           | Each engine each second               | As installed                                        | 1 Volt                       |                                                                                                                                                                                                                                 |
| 27 | Trim surface position                                                                | Full range or each discrete position | 1                                     | As installed                                        | 0.3% of full range           |                                                                                                                                                                                                                                 |



| N° | Parameter name                 | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks                                                             |
|----|--------------------------------|-------------------------|---------------------------------------|----------------------------|------------------------------|---------------------------------------------------------------------|
| 28 | Landing gear position          | Each discrete position* | Each gear every two seconds           | As installed               |                              | *Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required             | As required                           | As required                | As required                  |                                                                     |

]



## Appendix 1 to OPS 2H.431

### Data Link Recorder (DLR) Applications to be Recorded

(See OPS 2H.431)

- (a) Where the helicopter flight path is authorised or controlled through the use of data link messages, all data link messages, both uplinks (to the helicopter) and downlinks (from the helicopter), shall be recorded on the helicopter. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

*Note: Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the helicopter.*

- (b) Messages applying to the applications listed below shall be recorded. Applications without the asterisk (\*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (\*) shall be recorded only as far as is practicable given the architecture of the system.

| Item No. | Application type                      | Application description                                                                                                                                                                                                                                                                                                                                              | Recording content |
|----------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1        | Data link initiation                  | This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM), respectively.                                                                                                                                                                          | C                 |
| 2        | Controller-pilot communication        | This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances. | C                 |
| 3        | Addressed surveillance                | This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.   | C                 |
| 4        | Flight information                    | This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services.                                                                     | C                 |
| 5        | Aircraft broadcast surveillance       | This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the aircraft are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.                                                                 | M*                |
| 6        | Aeronautical operational control data | This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control).                                                                                                                                                                                                    | M*                |

**Key:**

C: Complete contents recorded.

M: Information that enables correlation to any associated records stored separately from the aeroplane.

\*: Applications that are to be recorded only as far as is practicable given the architecture of the system.

**SUBPART F****COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT****OPS 2H.501 Communication Equipment**

- (a) A helicopter to be operated in accordance with the instrument flight rules or at night shall be equipped with radio communication equipment capable of conducting two-way communication with those aeronautical stations and on those frequencies to meet airspace requirements.
- (b) When compliance with paragraph (a) requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.
- (c) A helicopter to be operated in accordance with VFR, but as a controlled flight, shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.
- (d) A helicopter to be operated on extended over water flights or flights over designated areas shall, unless exempted by the appropriate authority responsible for that airspace, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.
- (e) Radio communication equipment, if required by paragraphs (a) to (d) above, should provide for communication on the aeronautical emergency frequency 121.5 MHz.
- (f) For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), a helicopter shall, in addition to the requirements specified above;
  - (1) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s);
  - (2) have information relevant to the helicopter RCP specification capabilities listed in the flight manual or other helicopter documentation, approved by the State of Design or State of Registry; and
  - (3) where the helicopter is operated in accordance with a MEL, have information relevant to the helicopter RCP specification capabilities included in the MEL.
- (g) The Authority, as the State of Registry, shall establish criteria for operations where an RCP specification for PBC has been prescribed.
- (h) When establishing criteria for operations where an RCP specification for PBC has been prescribed, the Authority, as the State of Registry shall ensure that the operator/owner has established and documented:
  - (1) normal and abnormal procedures, including contingency procedures;
  - (2) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;



- (3) a training programme for relevant personnel consistent with the intended operations; and
  - (4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.
- (i) The Authority shall ensure that, in respect of those helicopters mentioned in sub-paragraph (f) above, adequate provisions exist for:
- (1) receiving the reports of observed communication performance issued by monitoring programmes; and
  - (2) taking immediate corrective action for individual helicopters, helicopter types or operators, identified in such reports as not complying with the RCP specification.

### **OPS 2H.502 Navigation Equipment**

A helicopter shall be equipped with navigation equipment that will enable it to proceed in accordance with:

- (a) the ATS flight plan, if applicable; and
- (b) the requirements of air traffic services.

except when, if not so precluded by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to landmarks.

- (c) [A helicopter shall have sufficient navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment shall allow safe navigation in accordance with (a) to be completed safely.
- (d) A helicopter operated on flights in which it is intended to land in IMC shall be equipped with navigation equipment capable of providing guidance to a point from which a visual landing can be performed. This equipment shall be capable of providing such guidance for each aerodrome, heliport or landing location at which is intended to land in IMC and for any designated alternate aerodromes or heliports.]

### **OPS 2H.503 Performance Based Navigation**

- (a) For operations where a navigation specification for performance-based navigation (PBN) has been prescribed, a helicopter shall, in addition to the requirements specified in OPS 2H.503:
  - (1) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s);
  - (2) have information relevant to the helicopter navigation specification capabilities listed in the flight manual or other helicopter documentation, approved by the State of Design or State of Registry; and
  - (3) where the helicopter is operated in accordance with a MEL, have information relevant to the helicopter navigation specification capabilities included in the MEL.
- (b) The Authority, as the State of Registry, shall establish criteria for operations where a navigation specification for PBN has been prescribed.



- (c) When establishing criteria for operations where a navigation specification for PBN has been prescribed, ensure that the operator/owner has established and documented:
- (1) normal and abnormal procedures, including contingency procedures;
  - (2) flight crew qualification and proficiency requirements, in accordance with appropriate navigation specifications;
  - (3) a training programme for relevant personnel consistent with the intended operations; and
  - (4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate navigation specifications.
- (d) The Authority, as the State of Registry, shall issue a specific approval for operations based on PBN authorisation required (AR) navigation specifications.
- (e) The helicopter shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with OPS 2H.503 and this regulation.

*Note: For international general aviation, this requirement may be met by means other than the duplication of equipment.*

- (f) On flights in which it is intended to land in instrument meteorological conditions, a helicopter shall be provided with appropriate navigation equipment providing guidance to a point from which a visual landing can be effected. This equipment shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

### **OPS 2H.507 Surveillance Equipment**

- (a) A helicopter shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.
- (b) For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), a helicopter shall, in addition to the requirements specified in sub-paragraph (a);
- (1) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);
  - (2) have information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or Authority; and
  - (3) where the helicopter is operated in accordance with a MEL, have information relevant to the helicopter RSP specification capabilities included in the MEL.
- (c) The Authority, as the State of the Registry, shall establish criteria for operations where an RSP specification for PBS has been prescribed.
- (d) In establishing criteria for operations where an RSP specification for PBS has been prescribed, the Authority shall require that the operator/owner has established and documented;



- (1) normal and abnormal procedures, including contingency procedures;
  - (2) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
  - (3) a training programme for relevant personnel consistent with the intended operations; and
  - (4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.
- (e) The Authority, as the State of Registry, shall ensure that, in respect of those helicopters mentioned in sub-paragraph (b), adequate provisions exist for;
- (1) receiving the reports of observed surveillance performance issued by monitoring programmes; and
  - (2) taking immediate corrective action for individual helicopter, helicopter types or operators, identified in such reports as not complying with the RSP specification.

#### **OPS 2H.508 Electronic Navigation Data Management**

- (a) An operator of a helicopter shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the State of Registry has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them. The State of Registry shall ensure that the operator continues to monitor both process and products.
- (b) An operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all helicopters that require it.



## SUBPART G

## [CONTINUING AIRWORTHINESS]

*Note: For the purpose of this chapter “helicopter” includes: engines, power transmissions, rotors, components, accessories, instruments, equipment and apparatus including emergency equipment.*

**OPS 2H.601 [Owner’s Continuing Airworthiness Responsibilities]**

- (a) The owner of a helicopter, or in the case where it is leased, the lessee, shall ensure, in accordance with the applicable regulations contained in CAR AIR, CAR GEN or CAR 21, that;
  - (1) the helicopter is maintained in an airworthy condition;
  - (2) the operational and emergency equipment necessary for an intended flight is serviceable; and
  - (3) the certificate of airworthiness of the helicopter remains valid.
- (b) The owner or the lessee shall not operate the helicopter unless it is maintained and released to service under a system acceptable to the State of Registry.
- (c) The owner or the lessee shall not operate a helicopter unless maintenance on the helicopter, including any associated engine, rotor and part is carried out, and released to service by an organisation appropriately approved/accepted in accordance with CAR 145 except that pre-flight inspections need not necessarily be carried out by the CAR 145 organisation.
- (d) When the maintenance release is not issued by an approved maintenance organisation, the person signing the maintenance release shall be licensed in accordance with ICAO Annex 1.
- (e) The owner or the lessee shall ensure that the maintenance of the helicopter is performed in accordance with a maintenance programme acceptable to the Authority as the State of Registry.
- (f) The owner or the lessee shall appoint an Airworthiness Coordinator who shall be responsible for the control of the maintenance system and the maintenance control manual, if applicable.

**OPS 2H.602 Continuing Airworthiness Records**

- (a) The owner of a helicopter, or in the case where it is leased, the lessee, shall ensure that the continuing airworthiness records are kept for the periods specified in CAR GEN.058:
- (b) In the event of a temporary change of owner or lessee, the records shall be made available to the new owner or lessee. In the event of any permanent change of owner or lessee, the records shall be transferred to the new owner or lessee.
- (c) The operator shall ensure that a system has been established to keep, in a form and format that ensures readability, security and integrity of the records at all times and is acceptable to the Authority.

*Note: The form and format of the records may include, for example, paper records, film records, electronic records or any combination thereof.*

**OPS 2H.603 Modifications and repairs**

All modifications and repairs shall comply with airworthiness requirements acceptable to the Authority, as the State of Registry. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

**OPS 2H.604 Maintenance Release**

- (a) A maintenance release shall be completed and signed, as prescribed by the Authority, as the State of Registry, to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures as stated in CAR GEN.
- (b) When maintenance is carried out by an approved maintenance organisation, the maintenance release shall be issued by the approved maintenance organisation in accordance with the provisions of CAR 145.
- (c) When maintenance is not carried out by an approved maintenance organisation, the maintenance release shall be completed and signed by a person appropriately licensed in accordance with ICAO Annex 1 to certify that the maintenance work performed has been completed satisfactorily and in accordance with approved data and the procedures as stated in CAR GEN.

**[OPS 2H.606 Continuing Airworthiness Information]**

The owner of a helicopter over 3175 kg maximum certificated take-off mass, or in the case where it is leased, the lessee, shall, as required by the Authority, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness is transmitted to the organisation responsible for type design of that helicopter.]

**OPS 2H.607 Maintenance Programme**

- (a) The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, acceptable to the Authority, as the State of Registry, containing the information;
  - (1) maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilisation of the helicopter;
  - (2) when applicable, a continuing structural integrity programme;
  - (3) procedures for changing or deviating from (a) and (b) above as approved by the State of Registry; and
  - (4) when applicable and approved by the State of Registry, condition monitoring and reliability programme descriptions for helicopter systems, components and engines.
- (b) Maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance programme, shall be identified as such.

*Note: The maintenance programme should be based on maintenance programme information made available by the State of Design or by the organisation responsible for the type design, and any additional applicable experience.*



- (c) The design and application of the operator's maintenance programme shall observe Human Factors principles according to the State of Registry's guidance material.
- (d) Copies of all amendments to the maintenance programme shall be furnished promptly to all organisations or persons to whom the maintenance programme has been issued.

#### **OPS 2H.608 Technical log**

The operator of a helicopter certificated for a maximum take-off mass exceeding 3175 kg shall provide a Technical Log for the helicopter in accordance with the requirements of CAR AIR, or CAR CAMO.540 where the continuing airworthiness management is contracted to a CAA approved CAR CAMO organisation.

**SUBPART H****FLIGHT CREW****OPS 2H.701 Qualifications**

- (a) The pilot-in-command shall:
  - (1) ensure that each flight crew member holds a valid licence issued by the Authority, as the State of Registry, or if issued by another Contracting State, rendered valid by the Authority as the State of Registry;
  - (2) ensure that flight crew members are properly rated; and
  - (3) be satisfied that flight crew members have maintained competency.
- (b) The pilot-in-command of a helicopter equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collision.

**OPS 2H.703 Composition of the Flight Crew**

The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

**[SUBPART I****MANUALS LOGS & RECORDS****OPS 2H.801 Flight manual**

The helicopter flight manual shall be updated by implementing changes made mandatory by the Authority as the State of Registry.

**OPS 2H.802 Journey log book**

- (a) A journey log book shall be maintained for every helicopter engaged in international air navigation in which shall be entered particulars of the helicopter, its crew and each journey.
- (b) The helicopter journey log should contain the following items:
  - (1) helicopter nationality and registration;
  - (2) date;
  - (3) crew member names and duty assignments;
  - (4) departure and arrival points and times;
  - (5) purpose of flight;
  - (6) observations regarding the flight; and
  - (7) signature of the pilot-in-command.

**OPS 2H.803 Records of emergency and survival equipment carried**

The owner of the helicopter, or in the case where it is leased, the lessee, shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board the helicopter engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.]

**[SUBPART J****SECURITY****OPS 2H.901 Security of helicopter**

The pilot-in-command shall be responsible for the security of the helicopter during its operation.

**OPS 2H.902 Reporting acts of unlawful interference**

Following an act of unlawful interference, the pilot-in-command shall submit a report of such an act to the designated local authority.

*Note: In the context of this Chapter, the word “security” is used in the sense of prevention of acts of unlawful interference against civil aviation.]*