Schedule 17

Mass & Balance & Performance

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SUBPART A: GENERAL

17.001 APPLICABILITY

(a) This Schedule prescribes mass and balance and aircraft performance and operating limitations in addition to those in Schedule 10,

(b) These requirements of this Schedule apply to aircraft used in—

(1) Commercial air transport operations; and

(2) General aviation operations, by—

(i) Turbojet airplanes; and

(ii) Large airplanes.

17.005 DEFINITIONS: GENERAL

(a) The following definitions apply to the general performance requirements of this Schedule—

Critical engine. The engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

En-route phase. That part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

Flight manual. A manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

Maximum mass. Maximum certificated take-off-mass.

Power loss. Any significant loss of power, the cause of which may be traced to engine or engine component, design, maintenance or installation, including design or installation of the fuel ancillary or engine control systems.

Safe forced landing. Unavoidable landing or ditching with a reasonable expectance of no injuries to person in the aircraft or on the surface.

(b) The following definitions apply to the aeroplane performance requirements of this Schedule—

Accelerate-stop distance available (ASDA). The length of the take-off run available plus the length of stopway, if provided.

Effective length of the runway. The distance for landing from the point at which the obstruction clearance plane associated with the approach end of the runway intersects the centreline of the runway to the far end.

Landing distance available (LDA). The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Large aeroplane. An aeroplane having a maximum certified takeoff mass of over 5,700 kg. (12,500 lbs),

Obstruction clearance plane. A plane sloping upward from the runway at a slope of 1:20 to the horizontal, and tangent to or clearing all obstructions within a specified area surrounding the runway as shown in a profile view of that area.

(i) In the plane view, the centreline of the specified area coincides with the centreline of the runway, beginning at the point where the obstruction clearance plane intersects the centreline of the runway and proceeding to a point at least 1,500 feet from the beginning point.

(ii) Thereafter, the centreline coincides with the takeoff path over the ground for the runway (in the case of takeoffs) or with the instrument approach counterpart (for landings), or where the applicable one of these paths has not been established, it proceeds consistent with turns of at least 4,000 foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions.

(iii) This area extends laterally 200 feet on each side of the centreline at the point where the obstruction clearance plane intersects the runway and continues at this width to the end of the runway;

(iv) Then it increases uniformly to 500 feet on each side of the centreline at a point 1,500 feet from the intersection of the obstruction clearance plane with the runway;

(v) Thereafter, it extends laterally 500 feet on each side of the centreline.

Small aeroplane. An aeroplane having a maximum certified takeoff mass of 5,700 kg. (12,500 lbs) or less.

(c) The following definitions apply to the helicopter performance requirements of this Subpart—

Approach and landing phase – helicopters. That part of the flight from 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point.

Congested hostile environment. A hostile environment within a congested area.

Defined point after takeoff. The point, within the takeoff and initial climb phase, before which the Class 2 helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

Defined point before landing. The point, within the approach and landing phase, after which the Class 2 helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

Elevated heliport. A heliport located on a raised structure on land.

Final approach and take-off area (FATO). A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by helicopters operating in performance Class 1, the defined area includes the rejected take-off area available.

Helideck. A heliport located on a floating or fixed offshore structure.

Heliport. An aerodrome or defined area on a structure intended to be used wholly or in part for the arrival, departure, and surface movement of helicopters.

Hostile environment. An environment in which—

(i) A safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or

(ii) The helicopter occupants cannot be adequately protected from the elements; or

(iii) Search and rescue response and/or capability is not provided consistent with anticipated exposure; or

(iv) There is an unacceptable risk of endangering persons or property on the ground.

Landing decision point. The point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a balked landing initiated.

Operations in performance Class 1. Operations with performance such that, in the event of a critical power-unit failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area.

Operations in performance Class 2. Operations with performance such that, in the event of critical power-unit failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

Operations in performance Class 3. Operations with performance such that, in the event of a power-unit failure at any time during the flight, a forced landing will be required.

Take-off and initial climb phase. That part of the flight from the start of take-off to 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or to the end of the climb in the other cases.

Takeoff decision point. The point used in determining takeoff performance of a Class 1 helicopter from which, an engine failure occurring at this point, either a rejected takeoff may be made or a takeoff safely continued.

V_{TOSS} The minimum speed at which climb shall be achieved with the critical engine inoperative, the remaining engines operating w

(d) The following definitions are applicable to operations in all helicopter performance classes—

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.

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 power-unit 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.

17.010 Acronyms & Abbreviations

(a) The following acronyms are used in this Schedule and shall apply to both aeroplanes and helicopters—

C.G. – Center of Gravity

MSL – Mean Sea Level

PIC – Pilot In Command

sm – Statute Miles

Vy – Best rate of climb speed.

(b) The following acronyms and abbreviations s apply to the airplance performance requirements of this Schedule—

AFM – Aeroplane Flight Manual.

V_1. – Takeoff decision speed

V_{mo}. – Maximum operating speed

V_{so}. – Stalling speed or the minimum steady flight speed in the landing configuration

(c) The following acronyms and abbreviations s apply to the helicopter performance requirements of this Schedule—

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
RFM – Rotorcraft Flight Manual
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_{TOSS} – Take-off safety speed

17.015 MINIMUM REQUIREMENTS

(a) Each person operating an aircraft subject to the applicability of this Schedule shall comply with the minimum performance approved or accepted by the Authority under the provisions of this Schedule.

(b) The Authority may authorise deviations from the requirements of this Schedule if special circumstances make a literal observance of a requirement unnecessary for safety.

(c) Where full compliance with the requirements of the Schedule cannot be shown due to specific design characteristics (e.g., seaplanes, airships, or supersonic aircraft), the operator shall apply approved performance standards that ensure a level of safety not less restrictive than those of relevant requirements of this Schedule that are acceptable to the Authority.

SUBPART B: APPLICABLE CODE OF PERFORMANCE

17.020 APPLICABILITY

(a) This Subpart provides the requirements applicable to the code of performance that shall be used by those operators subject to this Schedule.

17.025 APPROVAL OF CODE OF PERFORMANCE

(a) For aircraft of Bahamas registry, the operators of such aircraft must comply with the comprehensive and detailed code of performance approved for their aircraft during the process of certification by the Authority.

(b) For aircraft of other States of Registry to be operated under a Bahamas registry, the operators of such aircraft must comply with the comprehensive and detailed code of performance accepted for their aircraft during the process of certification by the Authority, provided that such codes are found to meet the minimum requirements of this Schedule.

17.030 ACCEPTABLE CODES OF PERFORMANCE

(a) The following comprehensive and detailed codes of performance will be available to and may be required by the Authority for commercial air transport operations of the category and class of aircraft—
  (1) United States Federal Aviation Administration,
  (2) European Joint Aviation Authorities,
  (3) Canadian Ministry of Transport; and
  (4) Brazil Ministry of Transport

17.035 CONSIDERATION OF OTHER CODES OF PERFORMANCE

(a) To be eligible for approval or acceptance by the Authority, the comprehensive and detailed code of performance issued by an ICAO Contracting State for commercial air transport may be considered provided—
  (1) The Code is in conformance with the applicable Standards of ICAO Annex 6 and 8;
  (2) The use of this Code will result in performance that meets the minimum requirements contained in this Schedule;

(3) This Code is in English or certified translation to English;
(4) A copy of this Code is provided with the application for including the aircraft on the Bahamas registry, and
(5) There is a satisfactory method of updating the Authority's copy of this Code throughout the period of time the aircraft is registered in the Bahamas.

SUBPART C: MASS & BALANCE

17.040 APPLICABILITY

(a) This Subpart is applicable to the general requirements for the supervision and procedures that are applicable to mass and balance.

17.045 SUPERVISION OF LOADING

(a) Each AOC holder shall designate in writing the person(s) that is to—
(1) Supervise the proper loading of the aircraft,
(2) Make the computation of the load manifest for aircraft loading and centre of gravity, and
(3) Determine that the aircraft will be capable of meeting the applicable performance requirements.

(b) This person(s) will be trained to competence for these tasks on each aircraft type and variant before being allowed to sign the load manifest.

(c) The person(s) supervising the loading and computing the aircraft load, centre of gravity and performance shall be provided the relevant current weights and aircraft limitations that will effect the performance of the that aircraft.

17.050 APPROVED METHOD REQUIRED

(a) No person shall compute the load manifest using any method, policy or information other that specifically approved by the Authority for the—
(1) Aircraft type,
(2) Supplemental loading documents,
(3) Seasonal issues,
(4) Non-standard passengers, and
(5) Type of operation to be conducted.

17.055 SIGNATURE REQUIRED

(a) The person preparing the load manifest shall be named on the document.

(b) The person supervising the loading of the aircraft shall confirm by signature that the load and its distribution and in accordance with the load manifest.

17.060 LAST MINUTE CHANGES

(a) Last minute changes to aircraft loading will be provided to the PIC and the person(s) responsible for computation of the aircraft loading and C.G.

(b) Unless there is an approved methodology for considering last minute changes to passenger or cargo weights, the person responsible for the computation will recompute all factors.

(c) The effect of the last minute changes will be provided to the PIC and the person(s) responsible for the computation of the aircraft loading and C.G.

(d) This information shall be noted on the load manifest that is retained at the airport of departure.

17.065 Determination of Aircraft Empty Operating Weight

(a) The aircraft's empty or dry operating weight must be determined through a weighing of the aircraft every 36 months.

(b) This information shall be provided to the person who is responsible for the computation of the mass and balance and centre of gravity

17.070 Determination of Actual Passenger Weights

(a) When making the determination of actual weights, the passengers' personal belongings and carry on baggage must be included.

(b) The weighing of the passengers and their items shall be conducted immediately prior to boarding and at a adjacent location.

17.075 Determination of Average Passenger Weights

(a) No person may use average passenger weights in the computation of aircraft loading and C.G., unless there has been a determination of the relationship between the actual weights being carried and the selected average weights to determine their validity.

(b) The method for the determination of the relationships shall be determined through the method prescribed by the Authority.

Subpart D: Computations Of Applicable Weights & Performance

17.080 Applicability

(a) This Subpart is applicable to the general requirements applicable to computations of weight, balance and operating performance for specific flights.

17.085 Source of Performance Data

(a) An operator shall ensure that the approved performance data contained in the approved flight manual is used to determine compliance with the requirements of this Schedule supplemented as necessary with other data acceptable to the Authority.

17.090 Obstacle Data

(a) The operator shall use available obstacle data applicable to the take-off, initial climb, approach and landing phases for the performance computations detailed in this Schedule.

(b) The operator shall use obstacle data from an source acceptable to the Authority for takeoff and landings and maneuvering for these procedures for operations of—

(1) Large aeroplanes; and

(2) Helicopters in congested hostile environments.

(c) The computations shall take into account the factors which may affect charting accuracy when using the obstacle data.

17.095 Aircraft Performance Calculations

(a) No person may commence a flight without ensuring that the applicable operating and performance limitations required for this Schedule can be accurately computed based on the AFM, RFM, or other data source approved by the Authority.

(b) Each person calculating performance and operating limitations for aircraft shall ensure that performance data used to determine compliance with this Schedule can, during any phase of flight, accurately account for—

(1) Any reasonably expected adverse operating conditions that may affect aircraft performance;

(2) One engine failure for aircraft having two engines, if applicable; and
(3) Two engine failure for aircraft having three or more engines, if applicable.

(c) When calculating the performance and limitation requirements, each person performing the calculation shall, for all engines operating and for inoperative engines, accurately account for—
(1) In all phases of flight—
(i) The effect of fuel and oil consumption on aircraft weight;
(ii) The effect of fuel consumption on fuel reserves resulting from changes in flight paths, winds, and aircraft configuration;
(iii) The effect of fuel jettisoning on aircraft weight and fuel reserves, if applicable and approved;
(iv) The effect of any ice protection system, if applicable and weather conditions require its use;
(v) Ambient temperatures and winds along intended route and any planned diversion;
(vi) Flight paths and minimum altitudes required to remain clear of obstacles.
(2) During takeoff and landing—
(i) The condition of the takeoff runway or area to be used, including any contaminates (e.g., water, slush, snow, ice);
(ii) The gradient of runway to be used;
(iii) The runway length including clearways and stopways, if applicable;
(iv) Pressure altitudes at takeoff and landing sites;
(v) Current ambient temperatures and winds at takeoff;
(vi) Forecast ambient temperatures and winds at each destination and planned alternate landing site;
(vii) The ground handling characteristics (e.g., braking action) of the type of aircraft; and
(viii) Landing aids and terrain that may affect the takeoff path, landing path, and landing roll.

(d) Where conditions are different from those on which the performance is based, compliance may be determined by interpolation or by computing the effects of changes in the specific variables, if the results of the interpolation or computations are substantially as accurate as the results of direct tests.

(e) To allow for wind effect, takeoff data based on still air may be corrected by taking into account not more than 50 percent of any reported headwind component and not less than 150 percent of any reported tailwind component.

17.100 MASS LIMITATIONS

(a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which the aircraft will be capable of complying with the performance safety margins of Subpart E and F of this Schedule for—
(1) Takeoff;
(2) Rejected takeoff;
(3) Climb;
(4) Continued flight en-route;
(5) Approach-Climb;
(6) Landing at the destination; and
(7) Landing at the specified alternate aerodromes.

(b) The determination of the mass limitations shall allow for expected reductions in mass as the flight proceeds, and for any fuel jettisoning as is required to comply with the maximum mass limitations.

(c) In no case shall the mass at the start of take off exceed the maximum take off mass specified in the flight manual for—
(1) The pressure altitude appropriate to the elevation of the aerodrome; and

(2) Any other local atmospheric condition that is used as a parameter to determine the maximum take off mass.

(d) In no case shall the estimated mass for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the maximum landing mass specified in the flight manual for the—

(1) The pressure altitude appropriate to the elevation of those aerodromes; and

(2) Any other local atmospheric condition that is used as a parameter to determine the maximum take off mass..

(e) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which compliance has been demonstrated with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized by competent authority of the State—

(1) In exceptional circumstances for a certain aerodrome; or

(2) On a runway where there is no noise disturbance problem.

SUBPART E: AEROPLANE PERFORMANCE & OPERATING LIMITATIONS

17.105 APPLICABILITY

(a) The Subpart is applicable to completing the performance computations for the operations of aeroplanes subject to this Schedule.

17.110 [RESERVED - PREVIOUS CONTENT RELOCATED TO 17.005]

17.115 [RESERVED - PREVIOUS CONTENT RELOCATED TO 17.010]S

Subdivision I: Restricted Performance Aeroplanes

17.120 SINGLE ENGINE AEROPLANES

(a) No person may operate a single-engine aeroplane used for passenger carrying operations in commercial air transport unless that aircraft is continually operated—

(1) In daylight;

(2) VMC, excluding over the top of any cloud layer; and

(3) Over such routes and diversions therefrom that permit a safe forced landing to be executed in the event of engine failure.

17.125 RESTRICTED PERFORMANCE MULTI-ENGINE AEROPLANES

(a) No person may operate a restricted performance multi-engine aeroplane with a passenger capacity of 9 passengers or less in commercial air transport carrying passengers that will be unable to comply with the performance limitations of this Schedule, unless that aircraft is continually operated at a weight that will allow it to climb, with the critical engine inoperative—

(1) At least 200 feet per minute immediately after takeoff;

(2) At least 50 feet a minute when operating at the MEAs of the intended route or any planned diversion, or at 5,000 feet MSL, whichever is higher; and

(3) At least 200 feet per minute in the climbout following a balked landing.

(b) If the performance capability of the aeroplane is computed to be less than specified in paragraph (b), the person(s) operating that aircraft shall comply with the performance restrictions applicable to single-engine aeroplane.

Subdivision II: Large Aeroplanes

17.130 TAKEOFF & CLIMB PHASE

(a) No person may commence a takeoff in aircraft unless, in the event of a critical power-unit failing at any point in the take-off, the performance calculations demonstrate that is is possible to—

(1) Discontinue the take-off and stop within either the accelerate-stop distance available or the runway available; or

(2) To continue the take-off and clear all obstacles along the flight path by an adequate margin as specified in paragraph (c) until the aeroplane is in a position to comply with safe en-route flight.

(b) The determination of the length of the runway available shall take into account any loss of runway length due to alignment of the aeroplane prior to take-off.

(c) No person may takeoff an aeroplane unless the following requirements are met when determining the maximum permitted take-off mass—

(1) The takeoff run shall not be greater than the length of the runway.

(2) For turbine engine powered aeroplanes—

(i) The takeoff distance shall not exceed the length of the runway plus the length of any clearway, except that the length of any clearway included in the calculation shall not be greater than 1/2 the length of the runway; and

(ii) The accelerate-stop distance shall not exceed the length of the runway, plus the length of any stopway, at any time during takeoff until reaching V_1.

(3) *For reciprocating engine powered aeroplanes*—

(i) The accelerate-stop distance shall not exceed the length of the runway at any time during takeoff until reaching V_1.

(4) If the critical engine fails at any time after the aeroplane reaches V_1, to continue the takeoff flight path and clear all obstacles either—

(i) By a height of at least 9.1 m (35 ft) vertically for turbine engine powered aeroplanes or 15.2 m (50 ft) for reciprocating engine powered aeroplanes; and

(ii) By at least 60 m (200 ft) horizontally within the aerodrome boundaries and by at least 90 meters (300 feet) horizontally after passing the boundaries, without banking more than 15 degrees at any point on the takeoff flight path.

17.135 EN-ROUTE PHASE: ALL ENGINES OPERATING

(a) No person may take off a reciprocating engine powered aeroplane at a weight that does not allow a rate of climb of at least 6.9 $V_{so,}$ (that is, the number of feet per minute obtained by multiplying the aircraft's minimum steady flight speed by 6.9) with all engines operating, at an altitude of at least 300 m (1,000 ft) above all terrain and obstructions within ten miles of each side of the intended track.

17.140 EN-ROUTE PHASE: ONE ENGINE INOPERATIVE

(a) No person may commence a takeoff unless the performance calculations demonstrate that the aircraft can, in the event of the critical engine becoming inoperative at any point along the route or planned diversions therefrom, continue the flight to an aerodrome where a landing within the safety margins specified in Section 17.150 without flying below the minimum obstacle clearance altitude at any point.

(b) No person may take off an aeroplane having two engines unless that aeroplane can, in the event of a power failure at the most critical point en route, continue the flight to a suitable aerodrome where a landing can be made while allowing—

(1) *For reciprocating engine powered aeroplanes*—

(i) At least a rate of climb of 0.079 - (0.106/number of engines installed) V_{so}^2 (when V_{so} is expressed in knots) at an altitude of 300 m (1,000 ft) above all terrain and obstructions within 9.3 km (5 sm), on each side of the intended track; and

(ii) A positive slope at an altitude of at least 450 m (1,500 ft) above the aerodrome where the aeroplane is assumed to land.

(2) *For turbine engine powered transport category aeroplanes—*

(i) A positive slope at an altitude of at least 300 m (1,000 ft) above all terrain and obstructions within 9.3 km (5 sm), on each side of the intended track;

(ii) A net flight path from cruising altitude to the intended landing aerodrome that allows at least 600 m (2,000 ft) clearance above all terrain and obstructions within 9.3 km (5 sm), on each side of the intended track; and

(iii) A positive slope at an altitude of at least 450 m (1,500 ft) above the aerodrome where the aeroplane is assumed to land;

(c) The climb rate specified in paragraph (a)(1)(i) may be amended to 0.026 V_{so}^2 for large transport category aircraft issued a type certificate prior to 1953.

(d) The 9.3 km (5 sm) clearance margin stated in paragraph (a) shall be increased to 18.5 km (10 sm) if navigational accuracy does not meet the 95% containment level.

17.145 EN-ROUTE PHASE: TWO ENGINES INOPERATIVE

(a) No person may takeoff an aeroplane having three or more engines at such a weight where there is no suitable landing aerodrome within 90 minutes at any point along the intended route (with all engines operating at cruising power), unless that aircraft can, in the event of simultaneous power failure of two critical engines at the most critical point along that route, continue to a suitable landing aerodrome while allowing—

(1) For turbine engine powered aeroplanes—

(i) A net flight path (considering the ambient temperatures anticipated along the track) clearing vertically by at least 2,000 feet all terrain and obstructions within five statute miles (4.34 nautical miles) on each side of the intended track;

(ii) A positive slope at 1,500 feet above the aerodrome of intended landing; and

(iii) Enough fuel to continue to the aerodrome of intended landing, to arrive at an altitude of at least 1,500 feet directly over the aerodrome, and thereafter to fly for 15 minutes at cruise power.

(2) For reciprocating engine powered aeroplanes—

(i) A rate of climb at 0.013 V_{so}^2 feet per minute (that is, the number of feet per minute is obtained by multiplying the number of knots squared by 0.013) at an altitude of 1,000 feet above the highest ground or obstruction within 10 miles on each side of the intended track, or at an altitude of 5,000 feet, which ever is higher; and

(ii) Enough fuel to continue to the aerodrome of intended landing and to arrive at an altitude of at least 300 m (1,000 ft) directly over that aerodrome.

(b) The performance calculation shall consider that the consumption of fuel and oil after the engine failure is the same as the consumption that is allowed for in the net flight path data in the AFM.

(c) When the two engines of the reciprocating aeroplane are predicted to fail at an altitude above the prescribed minimum altitude, compliance with the prescribed rate of climb need not be shown during the descent from the cruising altitude to the prescribed minimum altitude, if those requirements can be met once the prescribed minimum altitude is reached, and assuming descent to be along a net flight path and the rate of descent to be 0.013 V_{so}^2 greater than the rate in the approved performance data.

(d) If fuel jettisoning is authorised (or planned), the aeroplane's weight at the point where the two engines fail is considered to be not less than that which would include enough fuel to proceed to an aerodrome and to arrive at an altitude of at least 300 m (1,000 ft) directly over that aerodrome.

17.150 Approach & Landing Phase

(a) No person may take off an aeroplane used in commercial operations unless its weight on arrival at either the intended destination aerodrome or any planned alternate aerodrome would allow a full stop landing from a point 50 feet above the intersection of the obstruction clearance plane and the runway, and within—
  (1) For turbine engine powered aeroplanes, 60 percent of the effective length of each runway.
  (2) For reciprocating engine powered aeroplanes, 70 percent of the effective length of each runway.

(b) For the purpose of determining the allowable landing weight at the destination aerodrome, each person determining the landing limit shall ensure that—
  (1) The aeroplane is landed on the most favourable runway and in the most favourable direction, in still air; or
  (2) The aeroplane is landed on the most suitable runway considering the probable wind velocity and direction, runway conditions, the ground handling characteristics of the aeroplane, and considering other conditions such as landing aids and terrain.

(c) If the runway at the landing destination is reported or forecast to be wet or slippery, the landing distance available shall be at least 115 percent of the required landing distance unless, based on a showing of actual operating landing techniques on wet or slippery runways, a shorter landing distance (but not less than that required by paragraph (a)) has been approved for a specific type and model aeroplane and this information is included in the AFM.

(d) A turbine powered transport category aeroplane that would be prohibited from taking off because it could not meet the requirements of paragraph (a)(1), may take off if an alternate aerodrome is specified that meets all the requirements of paragraph (a).

Subpart F: Helicopter Performance & Operating Limitations

17.155 Applicability

(a) The Subpart is applicable to completing the performance computations for the operations of helicopters subject to this Schedule.

17.160 [Reserved - previous contest relocated to 17.005]

17.165 [Reserved - previous contest relocated to 17.010]

Subdivision I: General

17.170 Performance Requirements Based on Passenger Configuration

(a) No person may operate a helicopter with a passenger seating configurations of more than 19, unless that helicopter is operated in accordance with the requirements for performance Class 1.

(b) No person may operate a helicopter with a passenger seating configuration of 19 or less but more than 9, unless that helicopter is operated in accordance with the requirements of performance Class 1 or 2.

(c) No person may operate a helicopter with a passenger seating configuration of 9 or less unless that helicopter is operated in accordance with the requirements of performance Class 1, 2 or 3

Note: Refer to Section 10.513 for the more restrictive requirements regarding operations of operating any Performance Class 2 or 3 helicopter i within a congested hostile environment.

(d) The Authority may issue a waiver to one or more of these requirements based on a risk assessment that considers the extenuating factors that provide an equivalent level of safety including—
  (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 power-unit failure and the consequence of such an event;
  (4) The procedures to maintain the reliability of the power-unit(s);
  (5) The training and operational procedures to mitigate the consequences of the critical power-unit failure; and
  (6) Installation and utilization of a usage monitoring system.

17.175 ACCOUNTABILITY FOR WIND

(a) In addition to the requirements of Subpart C and D, to determine the performance of the helicopter for take-off and landing, accountability for wind should be no more than 50 per cent of any reported steady headwind component of 5 knots or more—
  (1) 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 should be allowed.
  (2) Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, these values may be varied.

17.180 OBSTACLE ACCOUNTABILITY AREA

(a) In addition to the requirements of Section17.090, for the purpose of the obstacle clearance requirements, an obstacle should be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than—
  (1) For VFR operations: 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—
    (i) 0.10 DR for VFR day operations
    (ii) 0.15 DR for VFR night operations
  (2) For IFR operations: 1.5 D (or 30 m, whichever is greater), plus:
    (i) 0.10 DR for IFR operations with accurate course guidance
    (ii) 0.15 DR for IFR operations with standard course guidance
    (iii) 0.30 DR for IFR operations without course guidance

(b) For operations with initial take-off conducted visually and converted to IFR/IMC at a transition point—
  (1) The criteria required in paragraph (a)(1) applies up to the transition point; then
  (2) The criteria required in paragraph (a)(2) applies after the transition point.

(c) For a take-off using a backup take-off procedure (or with lateral transition), for the purpose of the obstacle clearance requirements in paragraph (d)(4) below, an obstacle located below the backup flight path (lateral flight path) should 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—
    (i) 0.10 distance travelled from the back edge of the FATO for VFR day operations;
    (ii) 0.15 distance travelled from the back edge of the FATO for VFR night operations.

(d) Obstacles may be disregarded if they are situated beyond—
  (1) 7 R for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;

(2) 10 R for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
(3) 300 m if navigational accuracy can be achieved by appropriate navigation aids; and
(4) 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.

(e) The transition point should 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.

(f) When considering the missed approach flight path, the divergence of the obstacle accountability area should only apply after the end of the take-off distance available.

17.185 FATO Operating Area Considerations

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

(b) 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).

Subdivision II: Operations in Performance Class 1

17.190 Definitions

(a) The following definition are applicable only to operations in Performance Class 1—
(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.
(2) *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 a power-unit failure and rejection of the take-off at the take-off decision point.
(3) *Take-off distance required (TODRH).* The horizontal distance required from the start of the take-off to the point at which V_{TOSS}, a selected height and a positive climb gradient are achieved, following failure of the critical power-unit being recognized at TDP, the remaining power-units operating within approved operating limits. The selected height shall be determined with reference to either—
(i) The take-off surface; or
(ii) A level defined by the highest obstacle in the take-off distance required.

17.195 Takeoff & Initial Climb Phase

(a) The helicopter shall be able, in the event of the failure of the critical power-unit being recognized at or before the take-off decision point to—
(1) Discontinue the take-off and stop within the rejected take-off area available; or
(2) In the event of the failure of the critical power-unit being recognized at or after the take-off decision point, to continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with Section 17.215.

(b) To meed the requirement of paragraph (a)(1), the computed take-off mass shall indicate that the rejected take-off distance required will not exceed the rejected take-off distance available.

(c) To meet the requirement of paragraph (a)(2), the computed take-off mass shall indicate that the take-off distance required will not exceed the take-off distance available.

(d) The computed take-off mass shall indicate that the helicopter will 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 power-units operating at an appropriate power rating.

Refer to Appendix 1 to 17.195 for a graphic presentation of the requirement of this Section.

(e) As an alternative, the requirement above may be disregarded provided that the helicopter with the critical power-unit 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)

Refer to Appendix 2 to 17.195 for a graphic presentation of the alternative requirement of this Section.

(f) For elevated heliports, the appropriate clearance from the elevated heliport edge shall considered in the performance computation..

Refer to Appendix 3 to 17.195 for a graphic presentation of the requirement of this Section.

17.200 TAKEOFF FLIGHT PATH

(a) From the end of the take-off distance required with the critical power-unit inoperative. the computed take-off mass shall indicate that the climb path provides a vertical clearance above all obstacles located in the climb path of not less than—
  (1) 10.7 m (35 ft) for VFR operations; and
  (2) 10.7 m (35 ft) plus 0.01 DR for IFR operations.

(b) Only obstacles as specified in 17.215 should be considered.

(c) Where a change of direction of more than 15 degrees is made, obstacle clearance requirements should be increased by 5 m (15 ft) from the point at which the turn is initiated.

(d) The turn in paragraph (c) 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.

17.205 EN-ROUTE PHASE

(a) The helicopter shall be able, in the event of the failure of the critical power-unit at any point in the en-route phase—
  (1) To continue the flight to a site at which the performance requirements for Section 17.215 can be met;
  (2) Without flying below the appropriate minimum flight altitude at any point.

(b) The computed take-off mass shall indicate that it is possible, in case of the critical power-unit 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.

17.210 EN-ROUTE PHASE: TWO ENGINES INOPERATIVE

(a) No person shall takeoff a Class 1 helicopter having three or more engines unless that helicopter can, in the event of two critical engines failing simultaneously at any point in the en route phase, continue the flight to a suitable landing site.

17.215 APPROACH & LANDING PHASE

(a) In the event of the failure of the critical power-unit being recognized at any point during the approach and landing phase, before the landing decision point, the helicopter shall be able—
  (1) At the destination and at any alternate;
  (2) After clearing all obstacles in the approach path;
  (3) Land and stop within the landing distance available; or
  (4) To perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in Section 17.195.

(b) In case of the failure occurring after the landing decision point, the helicopter shall be able to land and stop within the landing distance available.

(c) No person may takeoff a helcopter unless the computed landing mass at the destination or alternate indicates that—

(1) The helicopter will 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 power-units operating at an appropriate power rating;

(2) The landing distance required does not exceed the landing distance available unless the helicopter, with the critical power-unit failure recognized at LDP can, when landing, clear all obstacles in the approach path;

(3) Iin case of the critical power-unit failure occurring at any point after the LDP, it will be possible to land and stop within the FATO; and

(4) In the event of the critical power-unit failure being recognized at the LDP or at any point before the LDP, it will be possible either to land and stop within the FATO or to overshoot, meeting the conditions of 17.195.

Refer to Appendices 1 and 2 to 17.215 for graphic presentation of these requirements for landings at both surface and elevated heliports.

Subdivision III: Operations in Performance Class 2

17.220 TAKEOFF & CLIMB PHASE

(a) The helicopter shall be able, in the event of the failure of the critical power-unit at any time after reaching DPATO, to continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with Section 17.225.

(b) Before the DPATO, failure of the critical power-unit may cause the helicopter to force-land; therefore the helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

(c) The computed 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 power-unit inoperative and the remaining power-units operating at an appropriate power rating.

Refer to Appendices 1 and 2 to 17.220 for a graphic presentation of the requirements of this Section.

(d) From DPATO or, as an alternative, no later than 60 m (200 ft) above the take-off surface with the critical power-unit inoperative—

(1) Where a change of direction of more than 15 degrees is made, obstacle clearance requirements should be increased by 5 m (15 ft) from the point at which the turn is initiated.

(2) The turn in paragraph (d)(1) 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.

17.225 EN-ROUTE PHASE

(a) The helicopter shall be able, in the event of the failure of the critical power-unit at any point in the en-route phase—

(1) To continue the flight to a site at which the performance requirements for Section 17.235 can be met;

(2) Without flying below the appropriate minimum flight altitude at any point.

17.230 EN-ROUTE PHASE: TWO ENGINES INOPERATIVE

(a) No person shall takeoff a Class 2 helicopter having three or more engines unless that helicopter can, in the event of two critical engines failing simultaneously at any point in the en route phase, continue the flight to a suitable landing site.

17.235 APPROACH & LANDING PHASE

(a) In the event of the failure of the critical power-unit before the DPBL, the computations of mass shall indicate that the helicopter should be able—

(1) At the destination and at any alternate;
(2) After clearing all obstacles in the approach path;
(3) Either to land and stop within the landing distance available; or
(4) To perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in Section17.220.

Refer to Appendix 1 and 2 to 17.235 for graphic presentations of the requirements of this Section.

(b) After the DPBL, failure of a power-unit may cause the helicopter to force-land; therefore the helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

Subdivision IV: Operations in Performance Class 3

17.240 GENERAL RESTRICTION

(a) Unless otherwise authorized by the Authority, all operations of helicopters in Performance Class 3 shall be conducted in a non-hostile environment.

(b) Unless the Authority grants specific approval, no person may operate a helicopter in Performance Class 3 operations in commercial air transport—

(1) Out of the sight of the surface; or
(2) At night; or
(3) When the cloud ceiling is less than 180 m (600 ft); or
(4) When the takeoff and en-route visibility is less than 800m.

17.245 TAKEOFF & CLIMB PHASE

(a) At any point of the takeoff and climb flight path, failure of a power-unit will cause the helicopter to force-land; therefore the helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

(b) Except as provided in paragraph (c), the computed 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 power-units operating at take-off power.

(c) If conditions are such that a hover in ground effect is not likely to be established, the take-off mass shall not exceed the computed maximum mass specified for a hover out of ground effect with all power-units operating at take-off power

(d) The computed take-off mass shall indicate that the climb path provides adequate vertical clearance above all obstacles located along the climb path, all engines operating.

17.250 EN-ROUTE PHASE

(a) The helicopter shall be able, with all power-units operating, to continue along its intended route or planned diversions without flying at any point below the appropriate minimum flight altitude.

(b) At any point of the en-route flight path, failure of a power-unit will cause the helicopter to force-land; therefore the helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

(c) The computed take-off mass shall indicate that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating.

17.255 Approach & Landing Phase

(a) At any point of the approach and landing flight path, failure of a power-unit will cause the helicopter to force-land; therefore the helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

(b) The computed landing mass at the destination or alternate shall be such that—

(1) It does not exceed the maximum landing mass specified in the flight manual for a hover in ground effect with all power-units operating at take-off power

(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 power-units operating at take-off power.

(3) 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.

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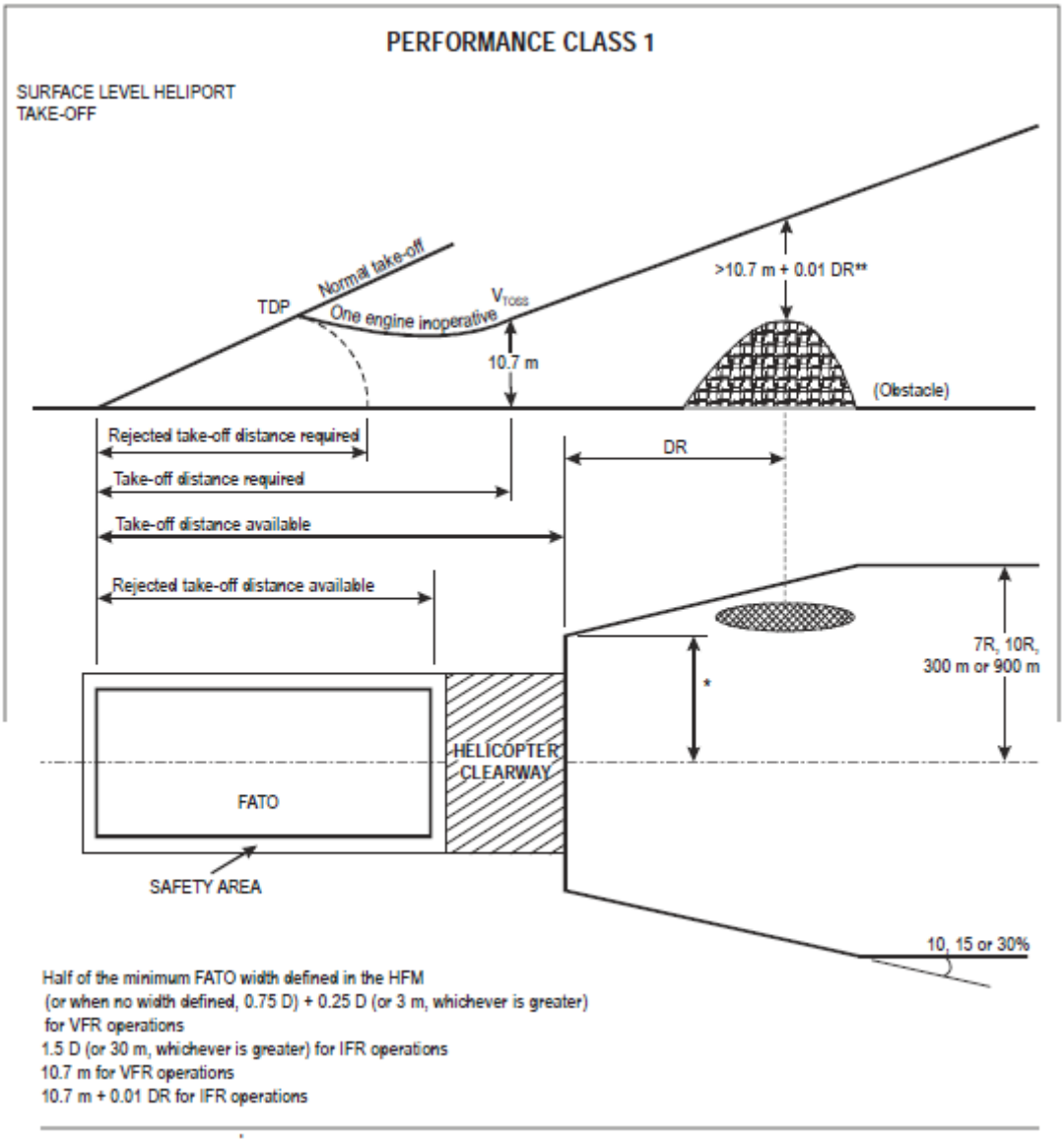
APPENDICES

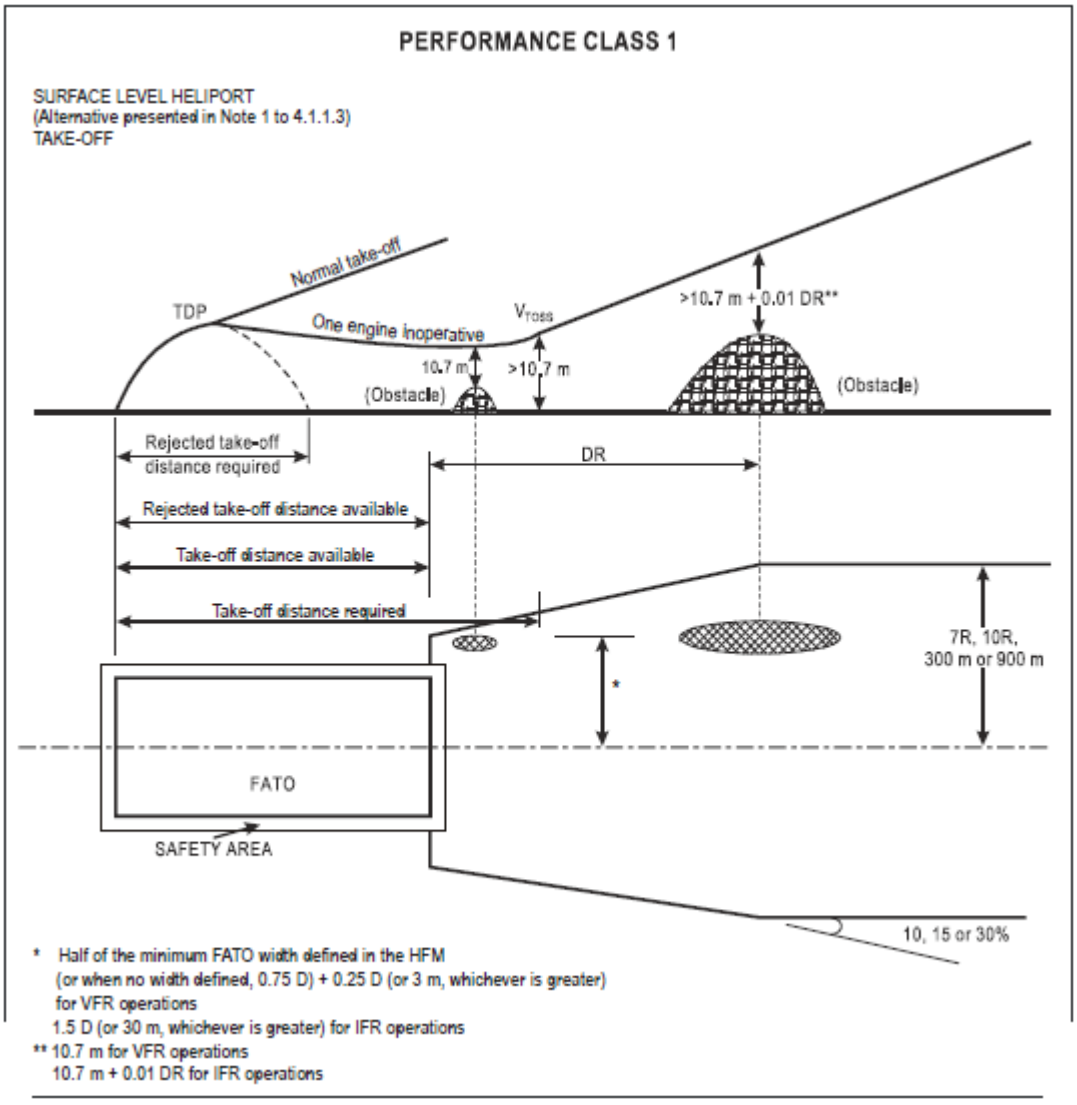
APPENDIX 1 TO 17.195: SURFACE LEVEL TAKEOFF: PERFORMANCE CLASS 1

This graphic provides a visual diagram of the requirements of Section 17.195—



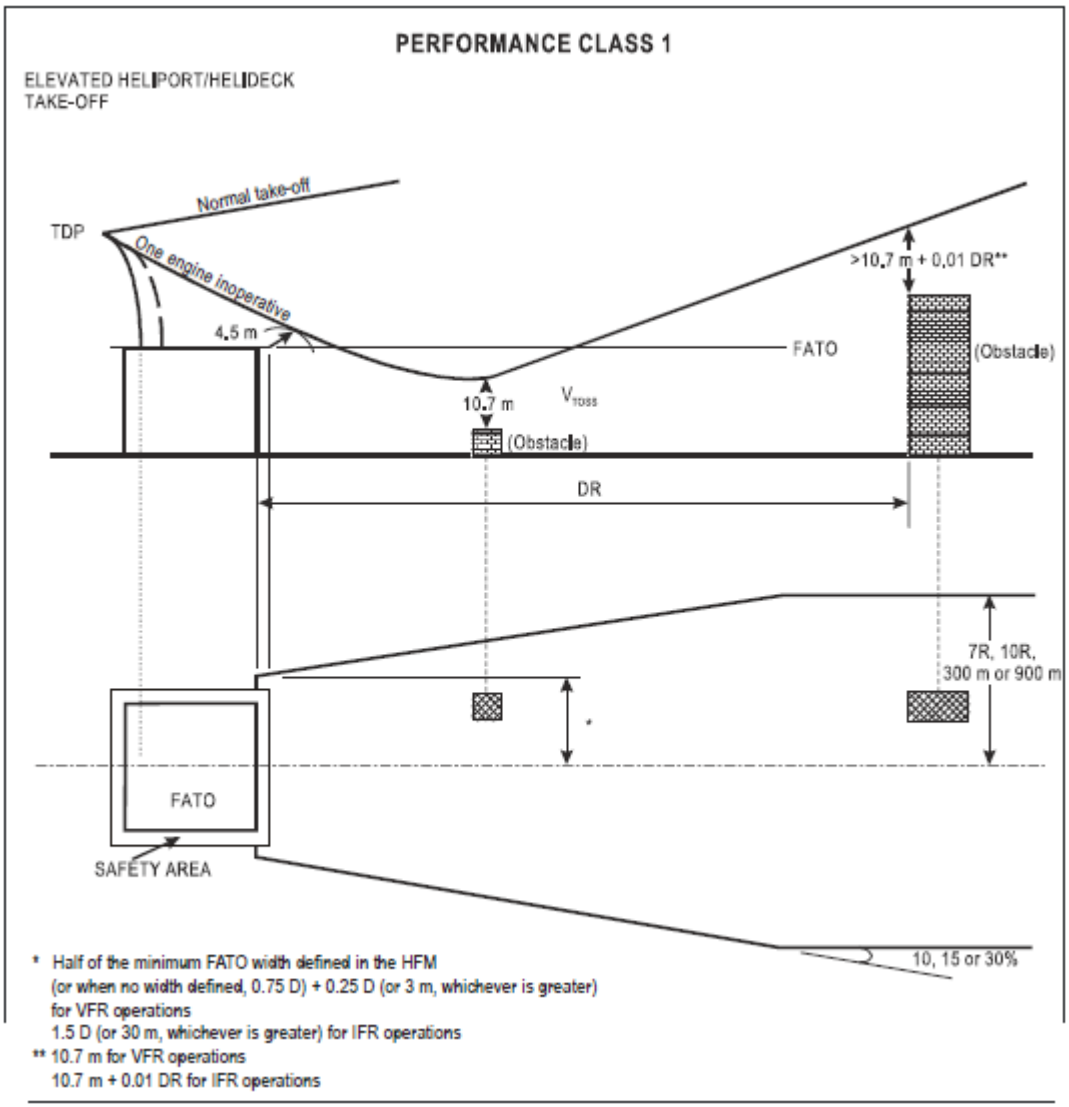
APPENDIX 2 TO 17.195: ALTERNATIVE SURFACE TAKEOFF: PERFORMANCE CLASS 1

This graphic provides a visual diagram of the alternative requirements of this Section 17.195—



APPENDIX 3 TO 17.195: ELEVATED TAKEOFF

This graphic provides a visual diagram of the requirements of Section 17.195—



APPENDIX 1 TO 17.215: SURFACE LEVEL LANDING: PERFORMANCE CLASS 1

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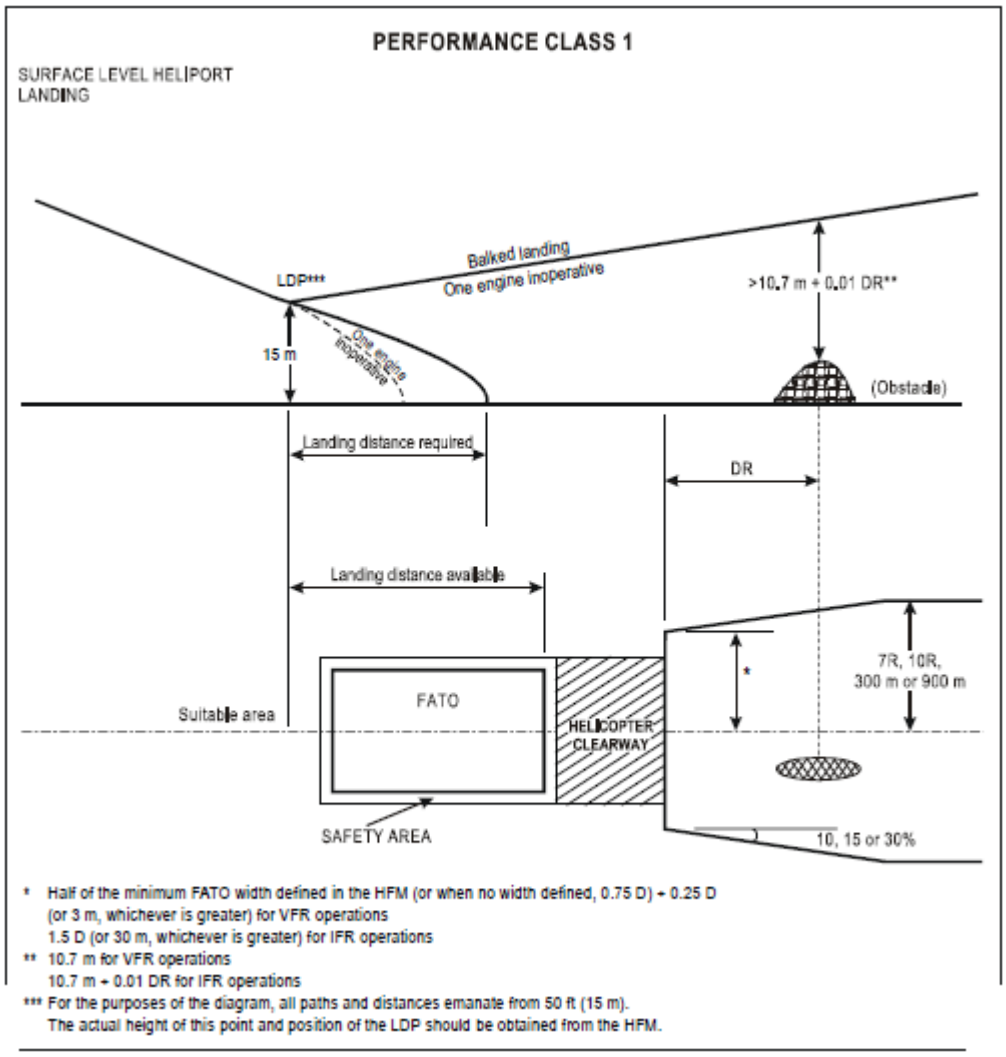


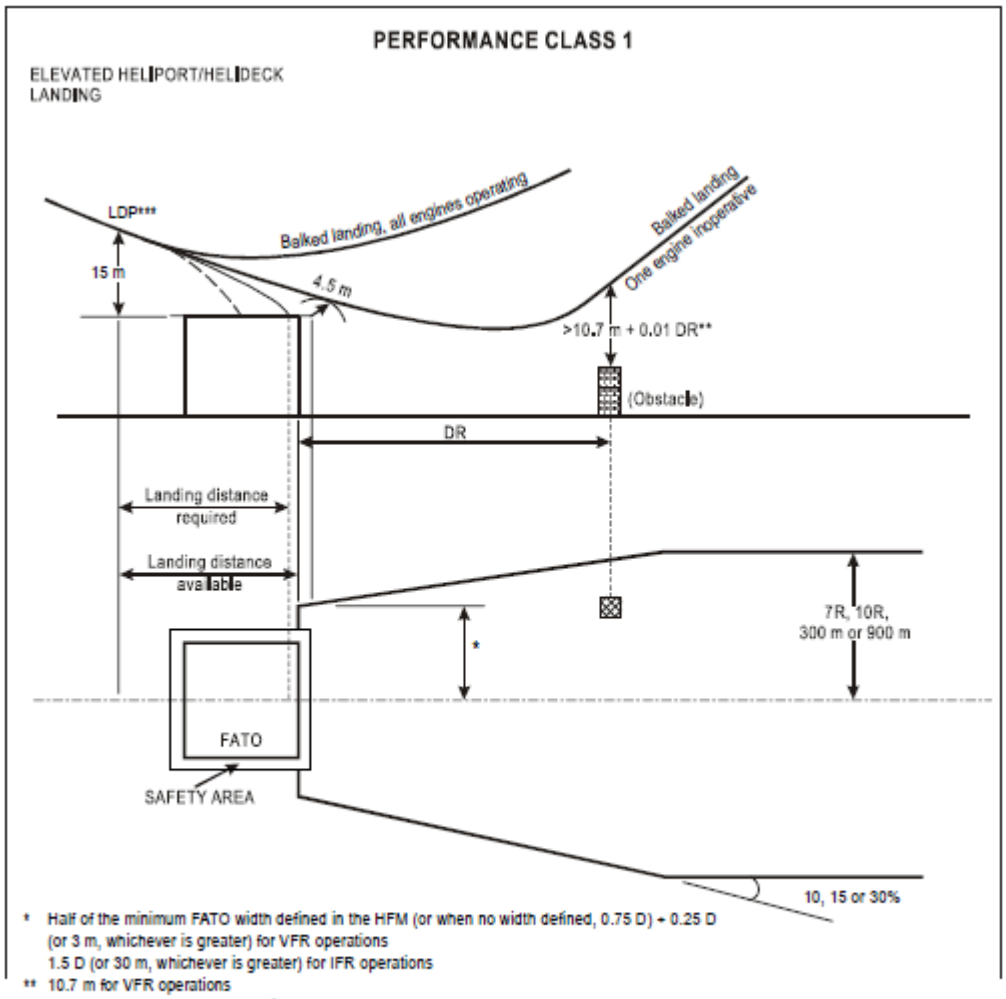
* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D
(or 3 m, whichever is greater) for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

*** For the purposes of the diagram, all paths and distances emanate from 50 ft (15 m).
The actual height of this point and position of the LDP should be obtained from the HFM.

APPENDIX 2 TO 17.215: ELEVATED LANDING: PERFORMANCE CLASS 1

This graphic provides a visual diagram of the requirements of this Section 17.215—



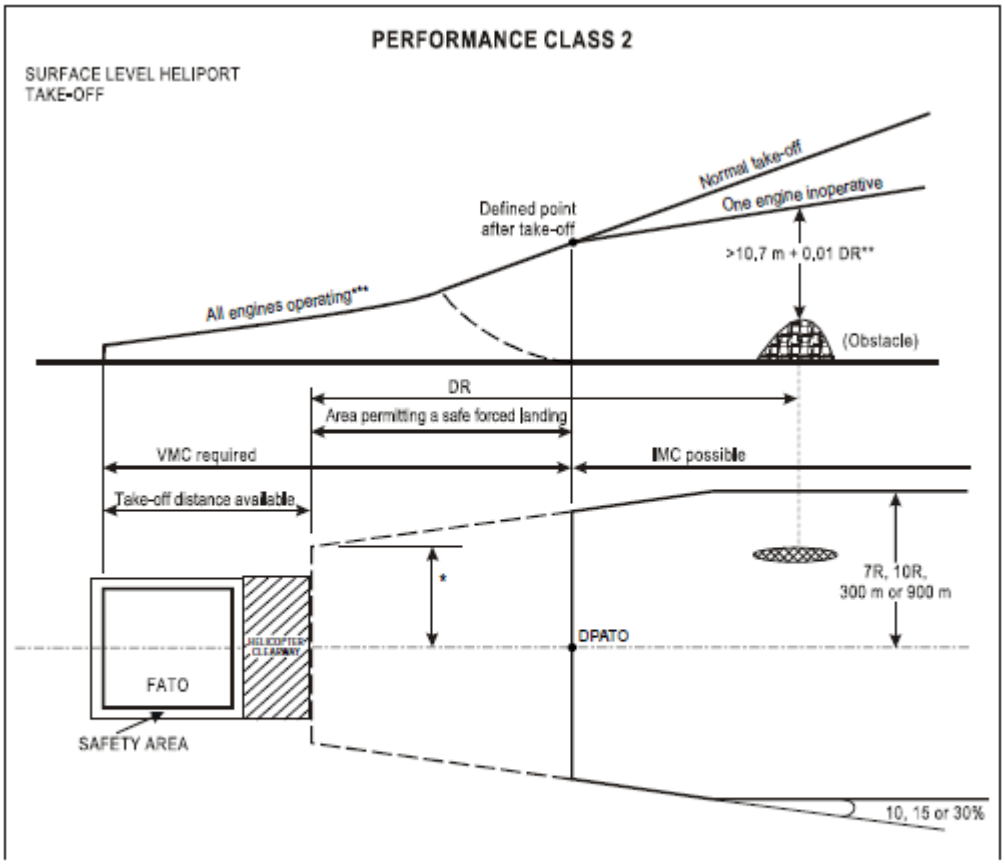
* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater) for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

*** For the purposes of the diagram, all paths and distances emanate from 50 ft (15 m).
The actual height of this point and position of the LDP should be obtained from the HFM.

APPENDIX 1 TO 17.220: SURFACE LEVEL TAKEOFF: PERFORMANCE CLASS 2

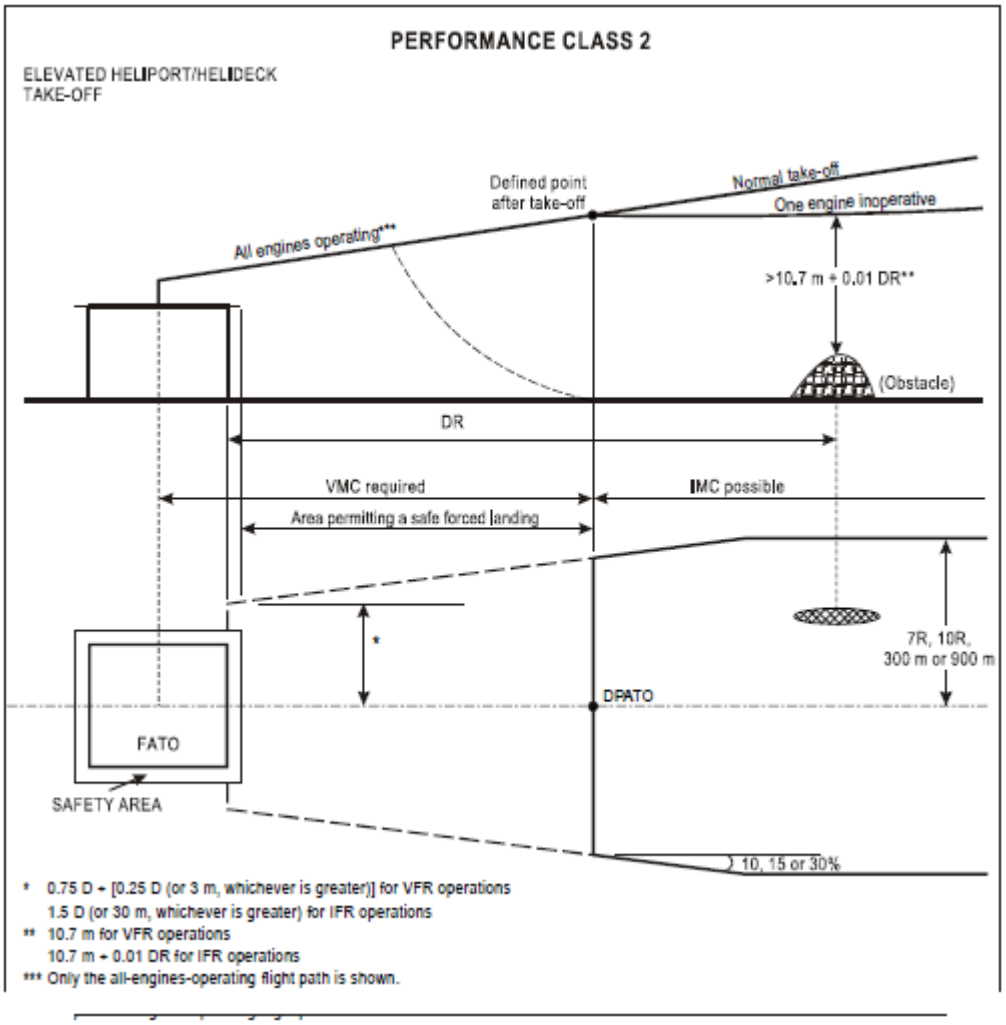
This graphic provides a visual diagram of the requirements of Section 17.220—



* 0.75 D + [0.25 D (or 3 m, whichever is greater)] for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations
*** Only the all-engines-operating flight path is shown.

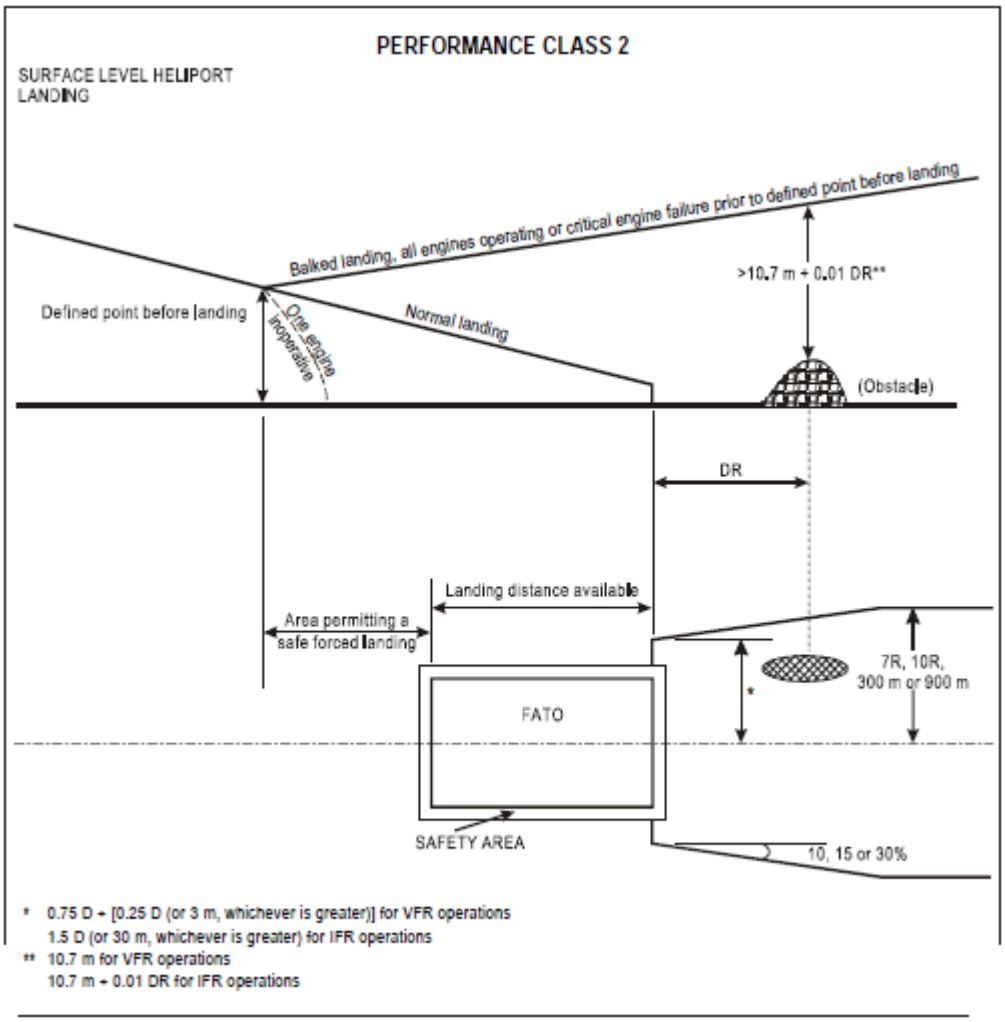
APPENDIX 2 TO 17.220: ELEVATED TAKEOFF: PERFORMANCE CLASS 2

This graphic provides a visual diagram of the requirements of Section 17.220 —



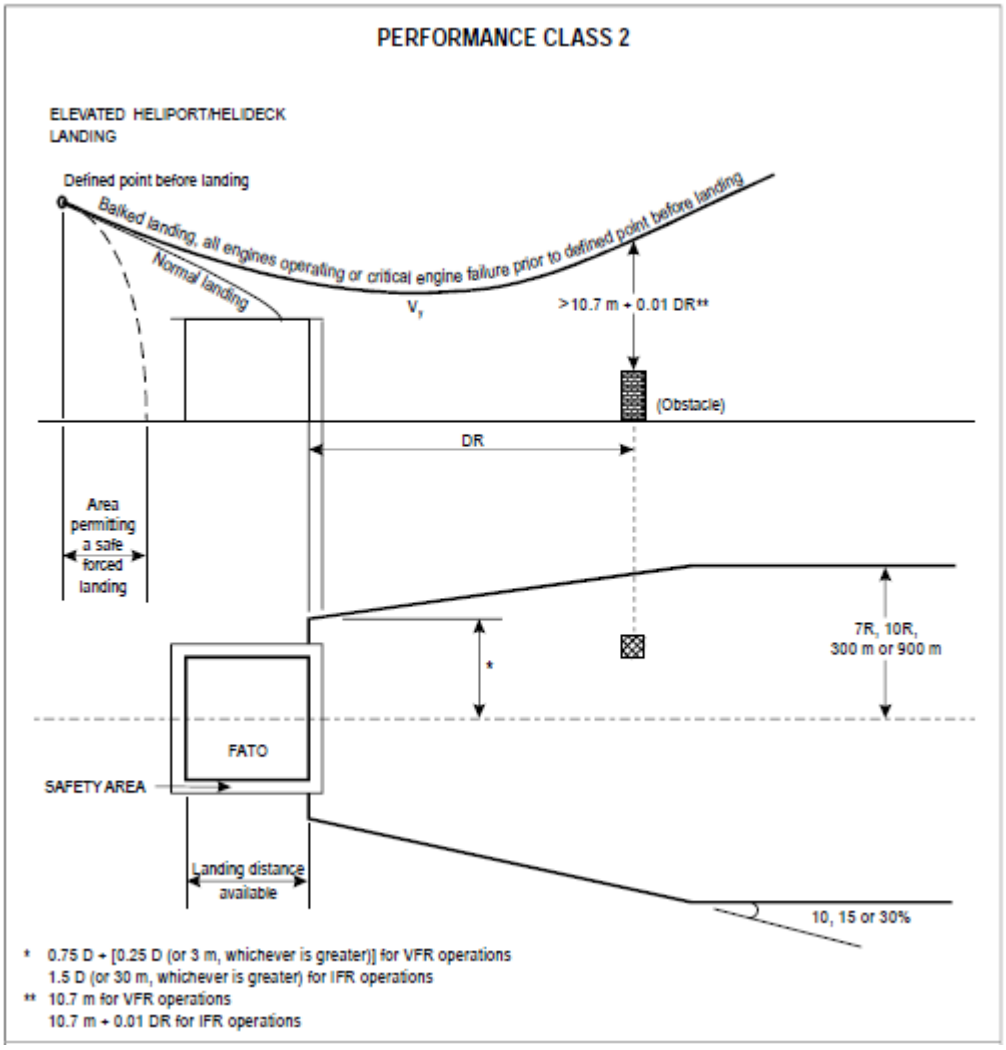
APPENDIX 1 TO 17.235: SURFACE LEVEL LANDING: PERFORMANCE CLASS 2

This graphic provides a visual diagram of the requirements of Section 17.235—



APPENDIX 2 TO 17.235: ELEVATED LANDING: PERFORMANCE CLASS 2

This graphic provides a visual diagram of the requirements of Section 17.235—



End of BASR Schedule 17