Part 17

[1]MASS, BALANCE AND PERFORMANCE

SUBPART A: GENERAL

[1] This content is revised according to Item 1, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

SUBPART A: GENERAL

[2]17.001 APPLICABILITY

(a) This Part prescribes the requirements of Vietnam for mass and balance and aircraft performance and operating limitations in addition to the general limitations contained in Part 10,

(b) These requirements of this Part apply to operations of aircraft in:

(1) Commercial air transport operations; and

(2) General aviation operations, by:

i. Turbojet airplanes; and

ii. Large airplanes.

(c) This Part is applicable to the persons and entities that operate the aircraft and the persons performing duties on their behalf.

17.003 DEFINITIONS

(a) For the purpose of this Part, the following definitions shall apply:

Note: Additional aviation-related terms are defined in Part 1 of these regulations.

(1) **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;

(2) **Critical engine**. The engine whose failure would most adversely affect the performance or handling qualities of an aircraft;

(3) **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;.

(4) **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;

(5) **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;

(6) **Elevated heliport.** A heliport located on a raised structure on land;

(7) **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;.

Where adequate obstacle clearance cannot be guaranteed visually, flights must be planned to ensure that obstacles can be cleared by an appropriate margin. In the event of failure of the critical power-unit, operators may need to adopt alternative procedures.

[2] This content is revised according to Item 2, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

(8) **Final approach and take-of area (FA TO).** 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 performance Class 1 helicopters, the defined area includes the rejected take-off area available;

(9) **Air Traffic Flight Plan.** A plan that a pilot or a representative is assigned to submit to ATS unit without any supplement;

(10) **Helideck**. A heliport located on a floating or fixed offshore structure;

(11) **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;

(12) **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;

(13) **Large aeroplane.** An aeroplane of a maximum certificated take-off mass of over 5 700 kg;

(14) **Maximum mass.** Maximum certificated take-off mass;

(15) **Obstacle clearance altitude (OCA) or obstacle clearance height (OCH).** The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria;

Note 1. Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

Note 2. For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

(16) **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 centerline 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; 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;

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

(17) **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;

(18) **Safe forced landing.** Unavoidable landing on land or water with a reasonable expectancy of no injuries to persons in the aircraft or on the surface;

(19) **Take-of decision point (TDP).** The point used in determining take-off performance from which, a power-unit failure occurring at this point, either a rejected take-off may be made or a take-off safely continued.

(b) Definitions only applicable to performance Class 1 helicopters:

(1) **Landing distance required (LDRH).** The horizontal distance required to land and come to a full stop from a point 10.7 m (35 ft) above the landing surface;

(2) **Rejected take-of 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 VTOSS, a height of 10.7 m (35 ft) above the take-off surface, and a positive climb gradient are achieved, following failure of the critical power-unit at TDP, the remaining power-units operating within approved operating limits.

(c) Definitions applicable to all performance classes of helicopters:

(1) **Distance DR.** DR is the horizontal distance that the helicopter has travelled from the end of the takeoff distance available;

(2) **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;

(3) **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;

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

(5) **Vy.** Best rate of climb speed

17.005 ACRONYMS

(1) AFM - Aeroplane Flight Manual;

(2) AGL - Above Ground Level;

(3) AOC - Air Operator Certificate;

(4) AOM - Aircraft Operating Manual;

(5) C.G - Center of Gravity;

(6) MEA - Minimum En Route Altitude;

(7) MOCA - Minimum Obstruction Clearance Altitude;

(8) MSL - Mean Sea Level;

(9) RFM - Rotorcraft Flight Manual;

(10) PIC - Pilot In Command;

(11) F/O - First Officer;

(12) SM - Statute Miles;

(13) V1 - Takeoff decision speed;

(14) V_{MO} -Maximum operating speed;

(15) V_{SO} - Stalling speed or the minimum steady flight speed in the landing configuration;

(16) Vy - Best rate of climb speed

17.007 MINIMUM REQUIREMENTS

(a) [3]Each person operating an aircraft subject to the applicability of this Part shall comply with the minimum performance approved or accepted by the Authority under the provisions of this Part.

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

(c) Where full compliance with the requirements of the Part 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 Part that are acceptable to CAAV.

SUBPART B: APPLICABLE CODE OF PERFORMANCE

[4]17.009 APPLICABILITY

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

[5]17.010 APPROVAL OF CODE OF PERFORMANCE

(a) For aircraft registered in Vietnam, the operators and pilots of such aircraft shall comply with the comprehensive and detailed code of performance approved for

[3] This content is revised according to Item 3, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.
[4] This content is revised according to Item 4, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.
[5] This content is revised according to Item 5, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

their aircraft during the process of aircraft airworthiness certification by the CAAV.

(b) For aircraft of other States of Registry to be operated under an AOC issued by Vietnam, 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 authorities responsible for the design and manufacture for their aircraft, provided that such codes are found to meet the minimum requirements of this Part.

17.013 ACCEPTABLE OF CODES OF PERFORMANCE

(a) The following comprehensive and detailed codes of performance will be available to and may be required by CAAV for commercial air transport operations of the category and class of aircraft:

(1) United States Federal Aviation Administration;

(2) European Joint Aviation Authorities; and

(3) Canadian Ministry of Transport.

(4) [6]National Civil Aviation Agency of Brazil.

17.015 CONSIDERATION OF OTHER CODES OF PERFORMANCE

(a) To be eligible for approval or acceptance by CAAV, 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 Annex 6 and 8 in Chicago Convention;

(2) The use of this Code will result in performance that meets the minimum requirements contained in this Part;

(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 AOC, and

(5) There is a satisfactory method of updating CAAV's copy of this Code throughout the period of time the aircraft is registered in Vietnam.

[7]17.016 EXCEPTIONS TO ADOPTED INTERNATIONAL PERFORMANCE STANDARDS

(a) Where new or revised ICAO Annex 8 Standards for required performance affecting a specific aircraft type are adopted, the Authority may grant an exception to allow continued operations after the effective date while the aircraft is modified to meet the new Standard.

(b) The aircraft owner or operator must petition the Authority for this exception, citing the basis and propose the plan for modification to meet the new Standard as soon as practicable.

[6] This content is revised according to Item 6, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.
[7] This content is revised according to Item 7, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

SUBPART C: MASS AND BALANCE

[8]17.019 APPLICABILITY

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

17. 020 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.

17.023 APPROVED METHOD REQUIRED

(a) No person shall compute the load manifest using any method, policy or information other that specifically approved or accepted by CAAV for the aircraft type, supplemental loading documents, seasonal issues, non-standard passengers, and type of operation to be conducted.

17.025 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.

17.027 LAST MINUTE CHANGE

(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 aerodrome of departure.

17.030 DETERMINATION OF AIRCRAFT EMPTY OPERATING WEIGHT

(a) Operator must develop regulations of aircraft load and centre of gravity for each

[8] This content is revised according to Item 8, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

aircraft type through a actual weighing before put into operation, then announcement shall be made for every 04 years in case of 01 aircraft operated, every 09 years in case of whole fleet operated. Incremental changes due to maintenance and repairs that affect aircraft load and centre of gravity must be appropriately calculated and recorded. In addition, the aircraft must be reweighed if the changes affect aircraft load and centre of gravity that can not be calculated exactly these changes

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

17.033 DETERMINATION OF CREW WEIGHTS

(a) The following weight shall be used to determine aircraft's empty or dry operating weight:

(1) The actual weight of any luggage of the crew;

(2) Standard weights, including hand luggage is 85 kg for the flight crew member and 75 kg for the cabin crew member;

(3) Other standard weights approved by CAAV.

(b) The operators must adjust the empty operating weight to calculate for any additional baggage. Of this additional baggage must be taken into account when setting the aircraft centre of gravity.

17.035 DETERMINATION OF ACTUAL PASSENGER WEIGHTS

(a) Operators must calculate the weights of passengers and luggage by weighing each person, each luggage or bases on the standard weights specified in Table 1 - 3 of Appendix 2 and 3 in Section 17.035, unless the number of passenger seats less than 10 or when passenger weight can be determined by the declaration of each passenger plus the weights of baggage and clothing as regulated. Method of determining the weights through the actual weights or standard weights and regulations to comply with in determining the weights of passengers through the declaration are published in operational manual (OM).
Note: Appendix 1, Section 17.035 defines "Determination of the weights of passengers through the declaration of each passenger plus the weights of baggage and clothing".

(b) If the weights are determined by weighing, operators must include personal effects and baggage. The weighing must be conducted immediately prior to boarding and at the adjacent location.

(c) If passenger's weights are determined through standard weight values, the table of standard weights must be followed. Standard weights include the weights of hand luggage and the weight of the baby sitting with adults. Baby on his own seat should be treated like children

Note: Appendix 2, Section 17.035 defines "Table of standard weight value to determine the weights of passengers"

Note: Appendix 3, Section 17.035 defined "Table of standard baggage weight value".

(d) If Operators want to use a alternative calculation rather than those given in table 1, 2 and 3 of Appendix 2 and 3 of Section 17.035, operators must report to

CAAV of the cause and only apply the alternative after being approved by CAAV. Alternative standard weights are only applied in situations in accordance with the purpose of the survey. Alternative standard weights exceed the standards in Table 1, 2 and 3 of Appendix 2 and 3 of Section 17.035, using a higher standard weight.

Note: Appendix 4, Section 17.035 regulates "Method to modify the value of standard weight of passengers and luggage".

(e) In any flight when realizing that many passengers with hand luggage exceeds the standard weights, Operators must identify the actual weight by weighing or adding adjustment.
Note: Appendix 5, Section 17.035 defines "Standard weight adjustment".

(f) If the value of the standard weights for checked cargo is used and there are some baggage of passengers exceeds the standard weights, operators must determine the actual weight of the baggage by weighing or adding adjustment.

Note: Appendix 5, Section 17.035 defines "Standard weight adjustment".

(g) Operators must ensure that the PIC must be notified when using non-standard methods to determine the load and the method must be published in the Weight & Balance Manual.

(h) Weighing passengers and carried items must be made immediately before boarding the aircraft at adjacent locations.

SUBPART D: COMPUTATIONS OF APPLICABLE WEIGHTS AND PERFORMANCE

[9]17.037a APPLICABILITY

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

[10]17.038 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 Part supplemented as necessary with other data acceptable to the CAAV.

[11]17.039 OBSTACLE DATA

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

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

(1) Large aeroplanes;

(2) Turbine-powered aeroplanes; and

(3) Helicopters in congested hostile environments.

9 This content is revised according to Item 9, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

10 This content is revised according to Item 10, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

11 This content is revised according to Item 11, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

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

17.040 AIRCRAFT PERFORMACE CALCULATIONS

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

(b) Each person calculating performance and operating limitations for aircraft used in commercial air transport shall ensure that performance data used to determine compliance with this Part 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; and

(3) Two engine failure for aircraft having three or more engines.

(c) [12]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 mass of the aircraft;

ii. Operating procedures;

iii. The effect of fuel and oil consumption on aircraft weight;

iv. The effect of fuel consumption on fuel reserves resulting from changes in flight paths, winds, and aircraft configuration;

v. The effect of fuel jettisoning on aircraft weight and fuel reserves, if applicable and approved;

vi. The effect of any ice protection system, if applicable and weather conditions require its use;

vii. Ambient temperatures and winds along intended route and any planned diversion;

viii. Flight paths and minimum altitudes required to remain clear of obstacles.

(2) During takeoff and landing:

i. The condition of the takeoff surface or area to be used, including any contaminates (e.g., water, slush, snow, ice on runway for landplanes; water surface conditions for seaplanes);

ii. The gradient (slope) of runway to be used;

iii. The runway length including clearways and stopways, if applicable;

iv. Pressure altitude appropriate to the elevation at takeoff and landing sites;

v. Current ambient temperatures and winds at takeoff;

[12] This content is revised according to Item 12, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

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.

(3) Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data.

(4) 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.

(d) [13]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.

(e) [14]The operator of the aircraft shall take such precautions as are reasonably possible to ensure that the general level of safety and risk associated with the intent of this Section is maintained under all expected operating conditions, including those not covered specifically by the requirements of this Part.

[15]17.043 MASS LIMITATIONS

(a) No person may operate an aircraft if at the mass of the aircraft at the start of takeoff would exceed the maximum mass:

(1) Specified as limitations for that aircraft in the approved flight manual;

(2) That ensures safe stopping prior to reaching the takeoff safety speed;

(3) That ensures safe lift-off and climb after takeoff;

(4) The clearing of all obstacles en-route by a safe margin, considering the expected reductions in mass including fuel jettisoning;

(5) Required for safe landing at the destination and alternate aerodromes (or, in the case of helicopters, heliport, helideck, elevated platforms and operational sites) at the expected time of arrival;

(6) Required for compliance with the applicable noise certification standards for that aircraft at all aerodromes and operational sites.

(b) All calculations relating in the determination of maximum mass shall include the pressure altitude appropriate to the elevation and, if used as a parameter to determine the maximum mass, any other local condition.

(c) The operator may exceed the requirement of paragraph (a)(6) in locations where the competent authority of that State of the Aerodrome has authorized an exception in exceptional circumstances where there is no noise disturbance problem.

[13] This content is revised according to Item 12, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.
[14] This content is revised according to Item 12, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.
[15] This content is revised according to Item 13, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[16]SUBPART E: AEROPLANE PERFORMANCE & OPERATING LIMITATIONS

17.049 APPLICABILITY

(a) The Subpart specifies the minimum acceptable performance of operations of aeroplanes subject to this Part.

Subdivision I: Restricted Performance Aeroplanes

17.050 SINGLE ENGINE AIRCRAFT

(a) Except as provided in paragraph (b), no person may operate a single-engine aircraft 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 there from that permit a safe forced landing to be executed in the event of engine failure.

(b) No person may operate a single-engine turbine-powered aircraft in passenger carrying operations in commercial air transport at night or IFR, unless has been demonstrated to CAAV that such operations will occur under a reliable level of safety and performance.

17.053 RESTRICTED PERFORMANCE MULTI-ENGINE AIRCRAFT

(a) No person may operate a restricted performance multi-engine aircraft 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 Part, 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 climb-out following a balked landing.

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

Subdivision II: Large or Turbine-Engined Aeroplanes

17.060 TAKEOFF & CLIMB PHASE

(a) No person may commence a takeoff in aircraft unless, in the event of a critical engine failing, or for other reasons, at any point in the takeoff, the performance calculations demonstrate that is possible to:

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

(2) To continue the takeoff and clear all obstacles along the flight path by an adequate margin as specified in paragraph (c) until the aeroplane is in a

[16] This content is revised according to Item 14, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

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 takeoff.

(c) No person may takeoff an aeroplane unless the following requirements are met when determining the maximum permitted takeoff 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 V1.

(3) For reciprocating engine powered aeroplanes: The accelerate-stop distance shall not exceed the length of the runway at any time during takeoff until reaching V1.

(4) If the critical engine fails at any time after the aeroplane reaches V1, 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.

(5) When determining the resulting take-off obstacle accountability area, the operating conditions, such as the crosswind component and navigation accuracy, must be taken into account

17.063 EN-ROUTE PHASE: ALL ENGINES OPERATING

(d) 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 Vso, (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.

17.065 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 17.070 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 Vso 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 an original 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.

17.067 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 Vso_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 Vso_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.

17.070 APPROACH & LANDING PHASE

(a) The operator shall assess the performance data to ensure that the aeroplane, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, will be able to land, with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available, in compliance with the requirements of this Section.

(b) The operator shall make allowance for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of the manufacturer's performance data.

(c) 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.

(d) 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.

(e) 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.

(f) 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).

[17]SUBPART F: HELICOPTER PERFORMANCE & OPERATING LIMITATIONS

17.080 APPLICABILITY

(a) The Subpart specifies the minimum acceptable performance requirements for operations of helicopters subject to this Part.

Subdivision I: Helicopter–General

17.083 PERFORMANCE REQUIREMENTS BASED ON PASSENGER CONFIGURATION

(a) No person may operate a helicopter with a passenger seating configurations of:

(1) More than 19, unless that helicopter is operated in accordance with the requirements for performance Class 1.

(2) 19 or less but more than 9, unless that helicopter is operated in accordance with the requirements of performance Class 1 or 2.

(3) 9 or less unless that helicopter is operated in accordance with the requirements of performance Class 1, 2 or 3

(b) Refer to Section 10.344 for the more restrictive requirement limitations regarding prohibition of operations of helicopters in Performance Class 2 or 3 within a congested hostile environment.

(c) 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);

[17] This content is revised according to Item 15, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

(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.

17.085 ACCOUNTABILITY FOR WIND

(a) In addition to the requirements of Subpart C and D, to determine the performance of the helicopter for takeoff 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 takeoff 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 takeoff and landing, these values may be varied.

17.087 OBSTACLE ACCOUNTABILITY AREA

(a) 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 takeoff 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 takeoff using a backup takeoff 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.

(5) 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 takeoff distance available.

17.090 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

17.093 TAKEOFF & INITIAL CLIMB PHASE: PERFORMANCE CLASS 1

(a) The helicopter shall be able, in the event of the failure of the critical power-unit being recognized at or before the takeoff decision point to:

(1) Discontinue the takeoff and stop within the rejected takeoff area available; or

(2) In the event of the failure of the critical power-unit being recognized at or after the takeoff decision point, to continue the takeoff, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with Section 17.095.

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

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

(d) The computed takeoff mass shall indicate that the helicopter will not exceed the maximum takeoff 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 17.093 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 takeoff, clear all obstacles from the end of the takeoff distance available to the end of the takeoff distance required by a vertical margin of not less than 10.7 m (35 ft). Refer to Appendix 2 to 17.093 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 to17.093 for a graphic presentation of the requirement of this Section.

17.095 TAKEOFF FLIGHT PATH: PERFORMANCE CLASS 1

(a) From the end of the takeoff distance required with the critical power-unit inoperative. the computed takeoff 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 Section17.085 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 takeoff surface, unless permitted as part of an approved procedure in the flight manual.

17.097 EN-ROUTE PHASE: PERFORMANCE CLASS 1

(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 17.103 can be met;

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

(b) The computed takeoff 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.

(c) The operator shall not conduct operations in this phase over a hostile environment where the diversion time to a suitable landing site would exceed 120 minutes unless this routing is specifically approved by the CAAV.

17.100 EN-ROUTE PHASE: TWO ENGINES INOPERATIVE: PERFORMANCE CLASS 1

(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.

17.103 APPROACH & LANDING PHASE: PERFORMANCE CLASS 1

(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 17.095.

(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 helicopter 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) In 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 17.095. Refer to Appendices 1 and 2 to 17.103 for graphic presentation of these requirements for landings at both surface and elevated heliports.

Subdivision III: Operations in Performance Class 2

17.105 TAKEOFF & CLIMB PHASE: PERFORMANCE CLASS 2

(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 takeoff, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with Section 17.107.

(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 takeoff shall not exceed the maximum takeoff 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 17.105 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 takeoff 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 takeoff surface, unless permitted as part of an approved procedure in the flight manual.

17.107 EN-ROUTE PHASE: PERFORMANCE CLASS 2

(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 17.113 can be met;

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

17.110 EN-ROUTE PHASE: TWO ENGINES INOPERATIVE

(a) No person shall takeoff a helicopter having three or more engines in Performance Class 2 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.

17.113 APPROACH & LANDING PHASE: PERFORMANCE CLASS 2

(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 Section 17.105. Refer to Appendix 1 and 2 to 17.113 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

17.115 GENERAL RESTRICTIONS: PERFORMANCE CLASS 3

(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 conduct commercial air transport operations in Performance Class 3 with helicopters:

(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; or

(5) In instrument meteorological conditions.

17.117 TAKEOFF & CLIMB PHASE: PERFORMANCE CLASS 3

(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 takeoff shall not exceed the maximum takeoff mass specified in the flight manual for a hover in ground effect with all power-units operating at takeoff power.

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

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

17.120 EN-ROUTE PHASE: PERFORMANCE CLASS 3

(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 takeoff mass shall indicate that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating.

17.123 APPROACH & LANDING PHASE: PERFORMANCE CLASS 3

(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 takeoff power

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

takeoff 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.

SUBPART G: *(removed)*[18]

SUBPART H: *(removed)*[19]

18 This content is revised according to Item 16, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

19 This content is revised according to Item 16 Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

APPENDICES

APPENDIX 1 SECTION 17.035: DETERMINATION OF ACTUAL PASSENGER WEIGHTS THROUGH DECLARATION

(a) For aircraft with total seat passengers under 10, when the weight of passengers through declaration, it is necessary to add weight of clothing and baggage. Weight is a constant and must be defined by operators after studying the specific route. This weight must not be less than:

(1) Clothing: 4 kg; and

(2) Hand luggage: 6kg.

(b) Ground staffs to welcome passengers aboard the helicopter need to assess the weight declared by the passengers and ad the weight of passengers' clothing to check their validity. These employees need to be trained how to evaluate the weight value. When necessary, the declared weight and the specific constants should be increased to avoid incorrect declaration.

APPENDIX 2 SECTION 17.035: TABLE OF STANDARD WEIGHT VALUE TO DETERMINE THE WEIGHTS OF PASSENGERS.

(a) Value of passenger weights – aircraft with 20 seats or more:

(1) When the total number of passenger seats ≥ 20, apply column of standard weights for men and women in Table 1 below. In the case of passenger seats ≥ 30, apply column "all adult" in Table 1 below.

(2) Weight value of charter flight shall be applied if less than 5% the number of passenger seats are used for some particular passengers.

Table 1

Number of passenger seats	20 or more		30 or more (all adult)
	Men	Women	
All flights except charter	88 kg	70 kg	75 kg
Charter	83 kg	69 kg	76 kg
Children	35 kg	35 kg	35 kg

(b) Value of passenger weight – aircraft with 19 seats or less:

(1) When the total number of passenger seats ≤ 19, apply standard weights for in Table 2;

(2) The flight without hand baggage or luggage alone can reduce 6kg for each men and women. Personal items such as coats, umbrellas, small handbag or makeup bag, books and magazines or small camera are not considered as hand luggage for the purpose of this paragraph.

Table 2

Number of passenger seats	1-5	6-9	10 - 19
Men	104 kg	96 kg	92 kg
Women	86 kg	78 kg	74 kg
Children	35 kg	35 kg	35 kg

APPENDIX 3 SECTION 17.035: TABLE OF STANDARD BAGGAGE WEIGHT VALUE.

(a) The number of seats on the aircraft ≥ 20, apply the standard weight in Table 3 for each type of baggage. The number of seats ≤ 19, determine the actual weight of the baggage by weighing.

Table 3

Flight	Standard baggage weights
International	11 kg
Domestic	15 kg

APPENDIX 4 ARTICLE 17.035 METHOD OF ESTABLISHING A MODIFIED WEIGHT VALUE OF PASSENGERS AND BAGGAGE.

(a) Passengers:

(1) Sample weighing: Average weight of passengers and their baggage must be determined by weighing several times. The selection of these attempts must be random and representative of group of passengers and having regard to the type of operation, the frequency of flights on various routes, departure flight, arrival flight, ability of seasonal performance and aircraft seats.

(2) The standard sample weighing: the number of passengers needed to be weighed must be the largest number of:

(i) The number of passengers are calculated from a trial weighing by conventional statistical methods and based on a tolerance (accuracy) 1% of adults and 2% for average weight male and female which is completed in sample weighing to determine the minimum number of passengers required and average weight;

(ii) The number of required sample weighing is 2000 passengers to aircraft of 40 seats or more;

(iii) The total sample weighing is 50 passengers multiplied by the number of seats on the aircraft to aircraft of 40 seats or less.

(3) Passenger's weight: passenger's weight must include personal effects they bring on board. When random sampling passenger's weight, the baby must be weighed along with accompanying adults;

(4) Location of weighing: location chosen is as near the aircraft as possible, where the change of weight by adding or removing personal effects does not happen before boarding;

(5) Weighing machine: the machine must be able to weigh at least 150 kg. Weight must be made at least every 500 g. The machine must be accurate to within 0.5% or 200 g, choose the larger value;

(6) Storage of weight value: passenger's weight, depending on the classification of passengers (men, women, and children) of each flight and number of flight, must be stored.

(b) Checked baggage: Statistical method is used to determine the correct luggage weight value based on the average weight of the luggage from the minimum sample weighing of passengers. To baggage, tolerance (accuracy) is 1%. Minimum sample weighing of baggage are 2000 units of baggage.

(c) Determination of value of modified standard weights of passenger and baggage.

(1) When determining weight by weighing, to ensure the use of the value of the modified standard weight of passengers and baggage does not adversely affect to safe operation, the statistical method must be used. Statistical methods will be the basis for determining the value of the average weight of passengers and luggage as well as other data;

(2) With aircraft ≥ 20 seats, the value of modified standard weights apply to men and women;

(3) For smaller aircraft, adjustment must be added to the average weight value to get the standard weight value as follows:

Number of passenger's seat	Additional weight
1 - 5	16 kg
6 - 9	8 kg
10 - 19	4 kg

Besides, the modified standard adult weight values (average) can be applied for the aircraft of 30 seats or more. The modified standard baggage weight values (average) can be applied for the aircraft of 20 seats or more;

(4) The operator chooses a detailed survey plan to submit to CAAV for approval and then give a tolerance value of modified standard weight values using the method described in this appendix. This tolerance value must be reassessed in a period not exceeding five years;

(5) The value of standard adult weights must be based on the ratio of male / female as 80/20 for all flights except charter flights this ratio is 50/50. If Operators want to use other ratio of male / female for private flights or special flights, the Operators must obtain the approval of CAAV, provided that the ratio of male / female must be at least 84% in the survey of 100 flights or more;

(6) The value of the average weight is rounded to number of kg closely. Checked baggage weight values are rounded to 0.5 kg when necessary.

APPENDIX 5 ARTICLE 17.035 MODIFICATIONS OF STANDARD WEIGHTS.

(a) When the standard weight value is used, paragraph (e) and (f) of Section 17.035,

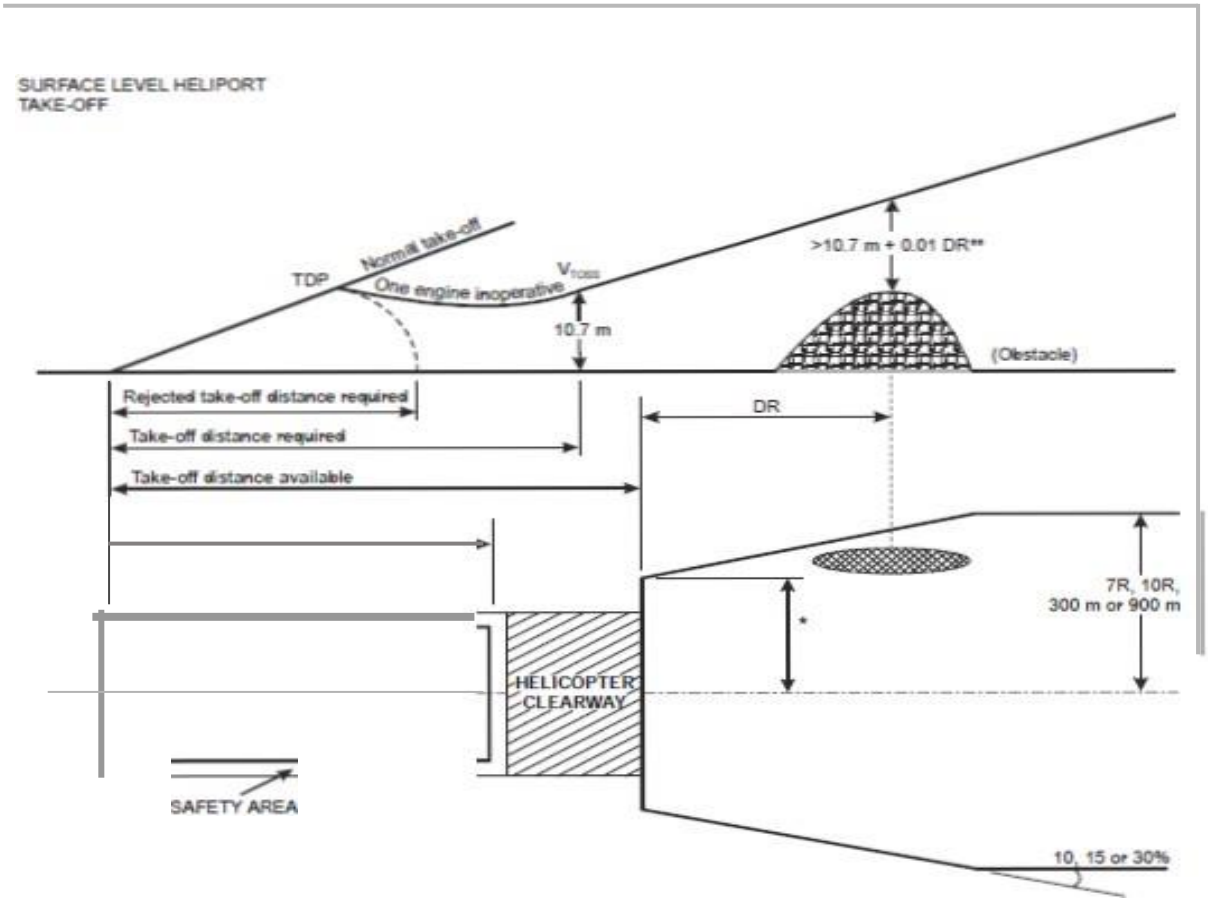
the operator must to agree and adjust the weight of passengers and checked baggage in the case of significant amount of passengers or the number of handbag is expected to exceed the standard weight. This requirement means that the Operational Manual (OM) have guidelines to ensure:

(1) Airport staff, operation staff, flight attendants and loading staff record or take appropriate action when large number of passengers and their hand baggage exceeds the allowed limit standard passenger weight and groups of passengers carrying heavy luggage (such as soldiers or sports teams); and

(2) On the small plane, when the risk of overloading or incorrect centre of gravity, the PIC must pay special attention to the load and calibrate properly the distribution of them.

[20]APPENDIX 1 TO 17.093: SURFACE LEVEL TAKEDFF: PERFORMANCE CLASS 1

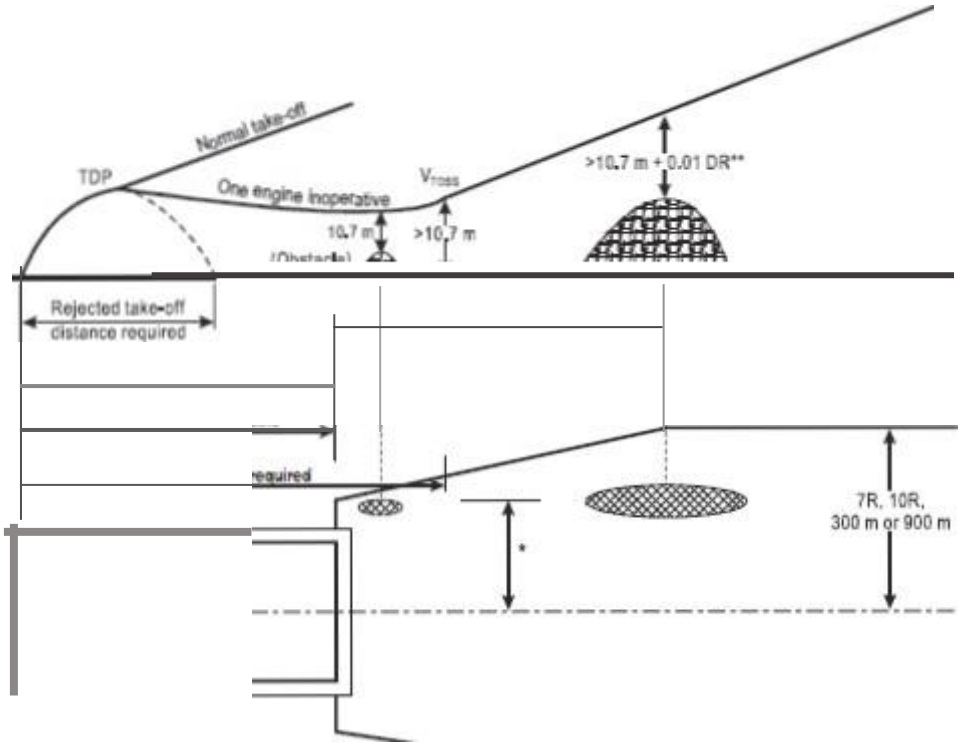
This graphic provides a visual diagram of the requirements of Section 17.093:



[20] This content is revised according to Item 18, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[21]APPENDIX 2 TO 17.093: ALTERNATIVE SURFACE TAKEDFF: PERFORMANCE CLASS 1

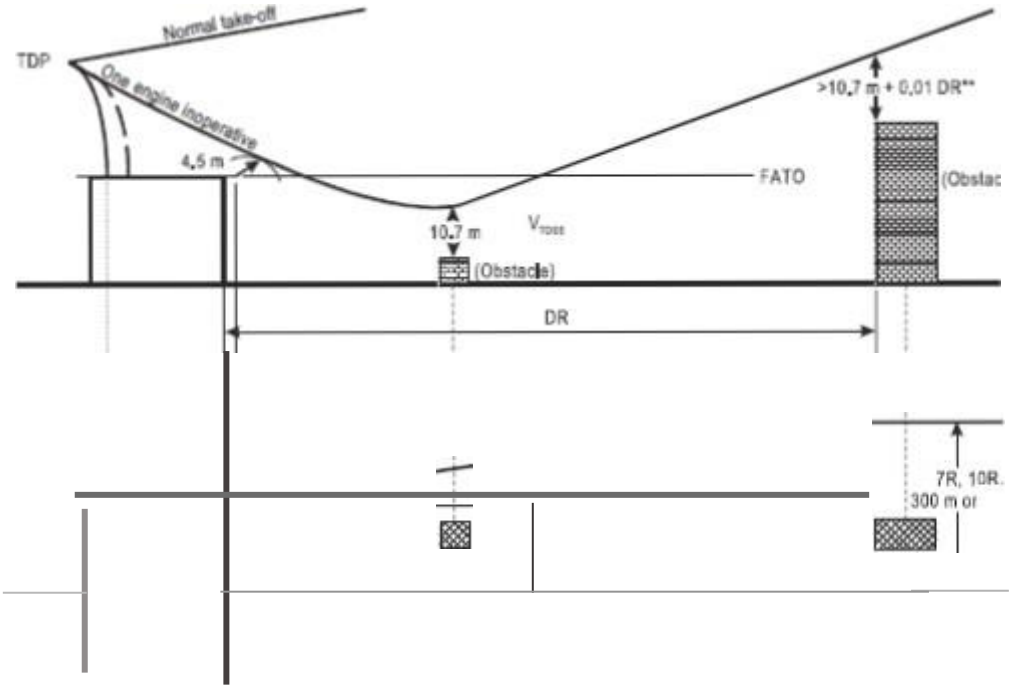
This graphic provides a visual diagram of the requirements of Section 17.093:



[21] This content is revised according to Item 18, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[22]APPENDIX 3 TO 17.093: ELEVATED TAKEDFF: PERFORMANCE CLASS 1

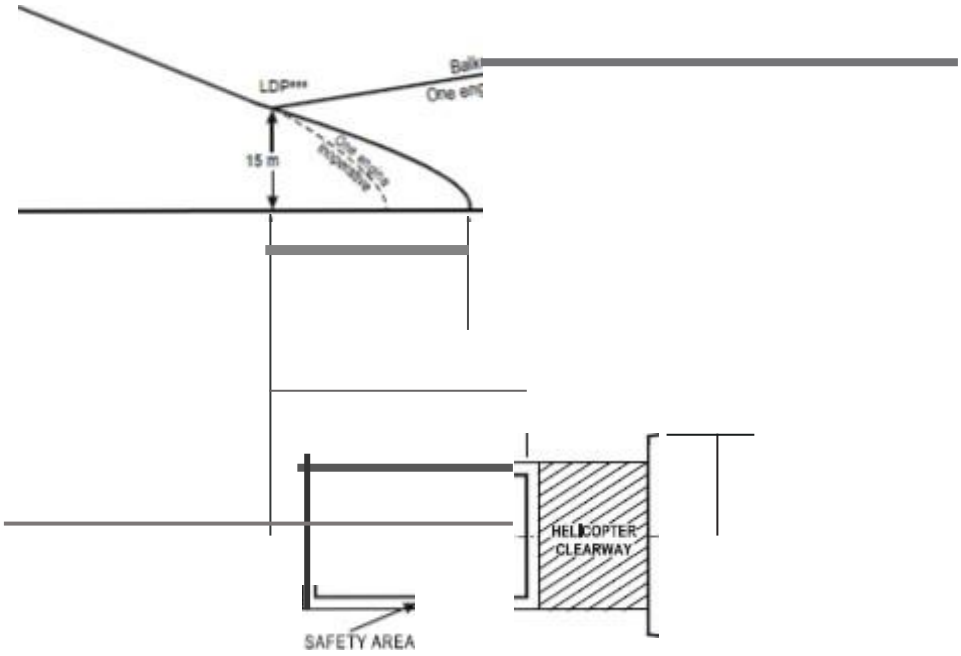
This graphic provides a visual diagram of the requirements of Section 17.093:



[22] This content is revised according to Item 18, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[23]APPENDIX 1 TO 17.103: SURFACE LEVEL LANDING: PERFORMANCE CLASS 1

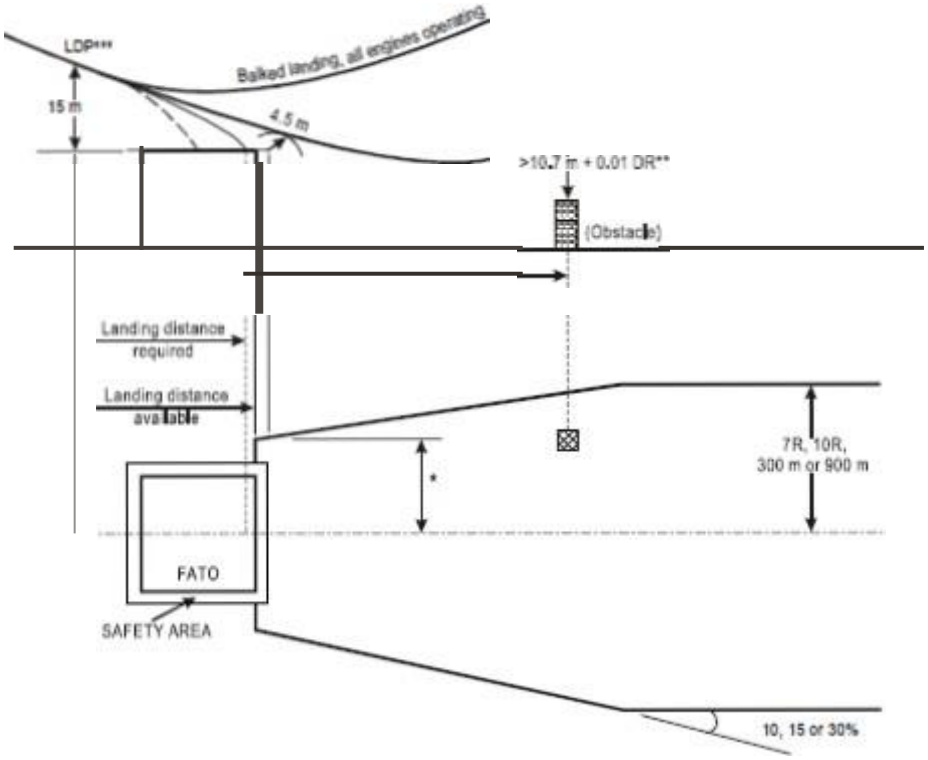
This graphic provides a visual diagram of the requirements of Section 17.103:



[23] This content is revised according to Item 19, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[24]APPENDIX 2 TO 17.103: ELEVATED LANDING: PERFORMANCE CLASS 1

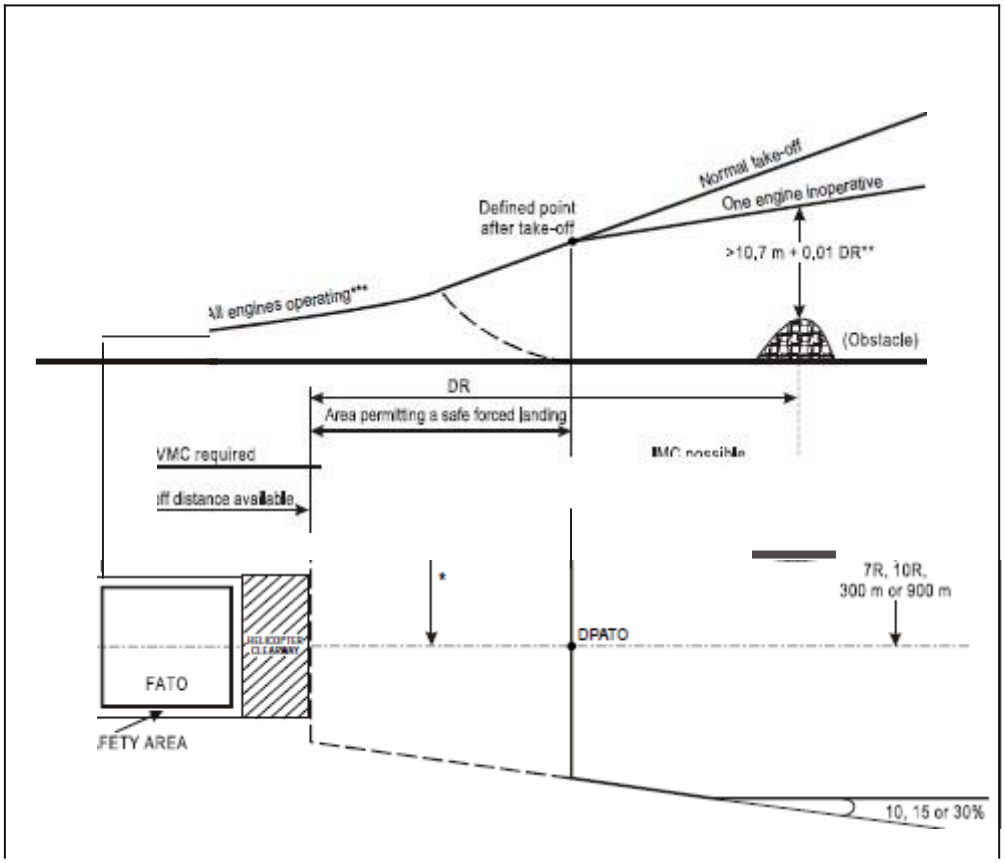
This graphic provides a visual diagram of the requirements of Section 17.103:



[24] This content is revised according to Item 19, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[25]APPENDIX 1 TO 17.105: SURFACE LEVEL TAKEOFF: PERFORMANCE CLASS 2

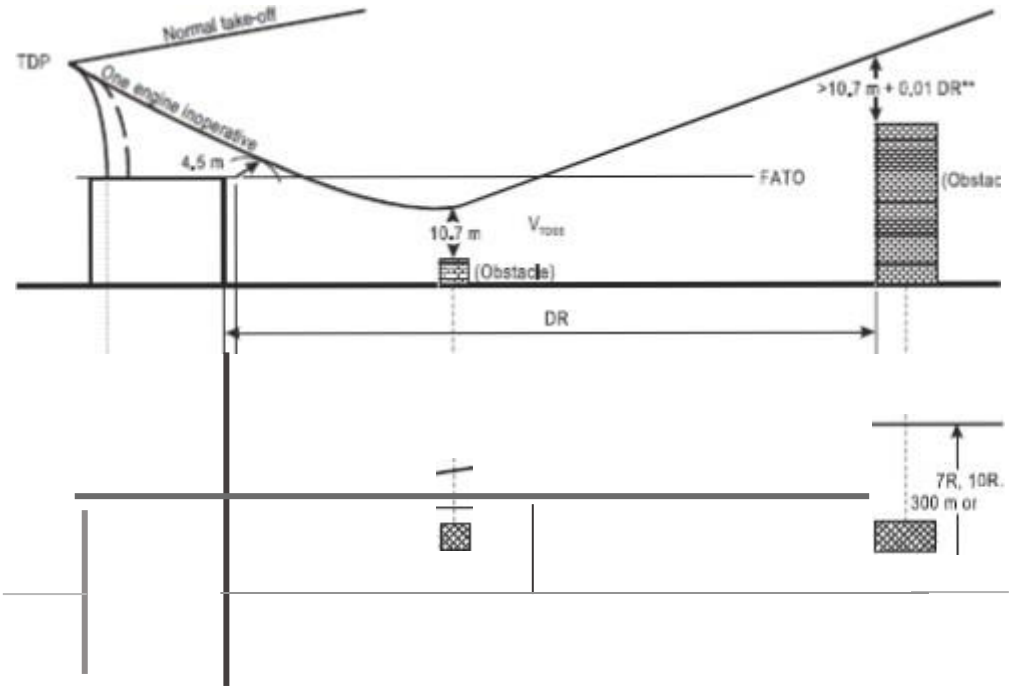
This graphic provides a visual diagram of the requirements of Section 17.105:



[25] This content is revised according to Item 20, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[26]APPENDIX 2 TO 17.105: ELEVATED TAKEOFF: PERFORMANCE CLASS 2

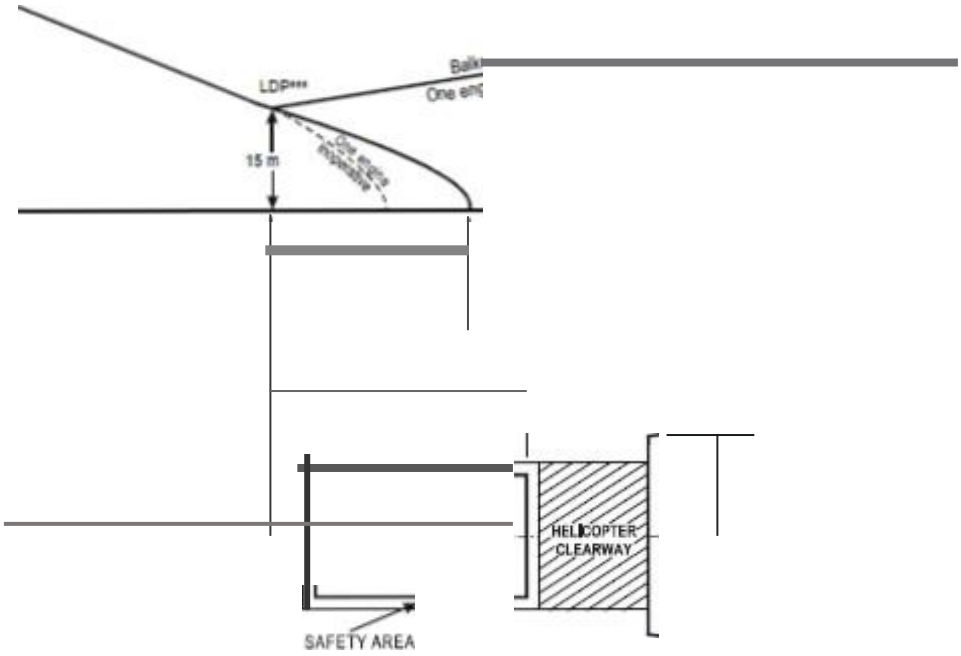
This graphic provides a visual diagram of the requirements of Section 17.105:



[26] This content is revised according to Item 20, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[27]APPENDIX 1 TO 17.113: SURFACE LEVEL LANDING: PERFORMANCE CLASS 2

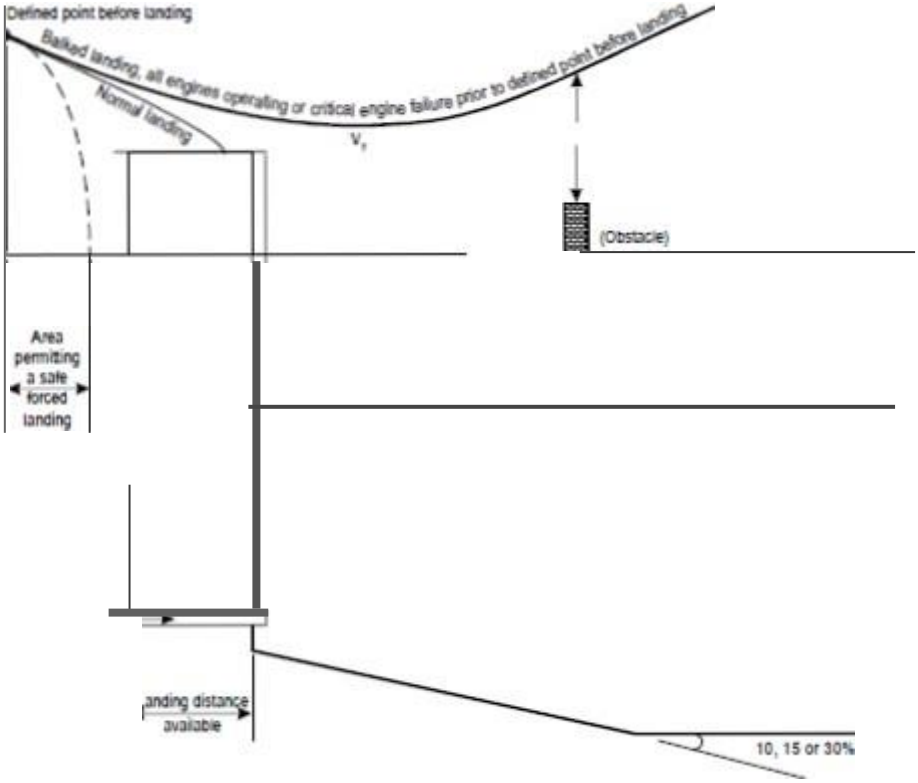
This graphic provides a visual diagram of the requirements of Section 17.113:



[27] This content is revised according to Item 21, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.

[28]APPENDIX 2 TO 17.113: ELEVATED LANDING: PERFORMANCE CLASS 2

This graphic provides a visual diagram of the requirements of Section 17.113:



[28] This content is revised according to Item 21, Appendix XV to Circular 03/2016/TT-BGTVT dated 31 March 2016.