

Part 15
¹FATIGUE MANAGEMENT

SUBPART A: GENERAL	2
15.001 APPLICABILITY	2
15.003 DEFINITIONS	2
15.005 ACRONYMS	3
15.007 OPERATOR RESPONSIBILITIES	3
15.008 FITNESS FOR DUTY	4
15.010 PRESCRIPTIVE VS FATIGUE RISK MANAGEMENT	4
15.012 MIRRORING OF FLIGHT & CABIN CREW SCHEDULES	4
15.013 RECORD KEEPING RESPONSIBILITIES	4
SUBPART B: PRESCRIPTIVE FLIGHT TIME, FLIGHT DUTY PERIOD AND REST PERIOD	5
15.020 FLIGHT TIME SPECIFICATION SCHEMES	5
15.023 HOME BASE	5
15.025 FLIGHT DUTY PERIOD - FDP	5
15.027 FLIGHT TIMES AND DUTY PERIODS	8
15.029 POSITIONING	8
15.031 SPLIT DUTY	8
15.033 STANDBY AND DUTIES AT THE AIRPORT	8
15.035 RESERVE	9
15.037 REST PERIODS	9
15.039 NUTRITION	10
15.041 FATIGUE MANAGEMENT TRAINING	10
15.043 MIXED FLYING TYPES OF OPERATION	10
SUBPART C: FATIGUE RISK MANAGEMENT SYSTEMS	10
15.060 APPLICABILITY	10
15.063 APPROVAL OF FATIGUE RISK MANAGEMENT SYSTEM	10
APPENDICES	12
APPENDIX 1 TO 15.025: FLIGHT DUTY PERIOD (FDP)	12
APPENDIX 2 TO 15.025: ALLOWABLE FLIGHT DUTY PERIOD - SINGLE PILOT	14
APPENDIX 2 TO 15.031: SPLIT DUTY	15
APPENDIX 1 TO 15.033: STANDBY	15
APPENDIX 1 TO 15.035: RESERVE	16
APPENDIX 1 TO 15.063: FRMS POLICY	17
APPENDIX 2 TO 15.063: FRMS DOCUMENTATION	18
APPENDIX 3 TO 15.063: FATIGUE RISK MANAGEMENT PROCESSES	18
APPENDIX 4 TO 15.063: FRMS SAFETY ASSURANCE PROCESSES	19
APPENDIX 5 TO 15.063: FRMS PROMOTION PROCESSES	20

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

SUBPART A: GENERAL

²15.001 APPLICABILITY

- (a) This Part prescribes the requirements of Vietnam regarding the maximum duty periods, maximum flight time and minimum rest periods and acceptable variations to these prescriptive requirements based on risk management to ensure that key crew and operations personnel do not experience fatigue during their assigned aviation duties.
- (b) This Part is applicable to operators, flight and cabin crews and flight dispatchers in general aviation, aerial work and commercial air transport operations of Vietnam-registered aircraft or where Vietnam has authorized these operations.

15.003 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) **Adequate facilities:** A quiet and comfortable place not open to the public;
- (2) **Augmented flight crew:** A flight crew which comprises more than the minimum number required for the operation of the aeroplane and in which each flight crew member can leave his post and be replaced by another appropriately qualified flight crew member;
- (3) **Break:** A period free of all duties, which counts as duty, being less than a rest period;
- (4) **Calendar day:** The period of elapsed time, using Coordinated Universal Time or local time, that begins at midnight and ends 24 hours later in the next midnight
- (5) **Deadhead Transportation:** Time spent in transportation on an aircraft (at the insistence of the AOC holder) to or from a crew member's home station;
- (6) **Duty Time:** The total time from the moment a person identified in this Part begins (immediately subsequent to a rest period) any work on behalf of the AOC holder until that person is relieved of all duties;
- (7) **Flight.** The period from takeoff to landing, sometimes referred to as "sectors."
- (8) **Flight Duty Period:** The total time from the moment a flight crew member commences duty to the moment the flight crew member is relieved of all duties having completed such flight or series of flights.
- (9) **Flight Time:** The period of time that the aircraft first moves under its own power until it is parked with engines shutdown:
 - (i) Flight time — aeroplanes: The total time from the moment an aeroplane first moves to taxi for the purpose of taking off until the moment it finally comes to rest at the end of the flight;
 - (ii) Flight time — helicopters. The total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

Note: The definition of flight time is of necessity very general but in the context of limitations it is, of course, intended to apply to flight crew members in accordance with the relevant definition of a flight crew member. Pursuant to that latter definition, licensed crew personnel travelling as passengers cannot be considered flight crew members, although this should

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

be taken into account in arranging rest periods.

- (10) **Home base:** The place nominated by the operator to the crew member from where the crew member normally starts and ends a duty periods and at which place, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned;
- (11) **Notification time:** The period of time that an operator allows between the time a crew member on standby receives a call requiring him to report for duty and the time he is required to report for that duty;
- (12) **Rest period:** A period free of all restraint, duty or responsibility for an AOC holder conducting commercial air transport operations;
- (13) **Reporting time:** The time at which the crew member is required to report for any duty. The reporting time is expressed in the local time at the reporting place.
- (14) **Split duty:** A flight duty period which consists of two duties separated by a break.
- (15) **Standby:** A defined period of time during which a crew member has not been assigned to any duty, but during which he is required by the operator to be available to receive an assignment for duty without an intervening rest period;
- (16) **Suitable accommodation:** A suitably furnished bedroom, with single occupancy which is subject to minimum noise, is well ventilated and should have the facility to control the levels of light and temperature.

15.005 ACRONYMS

- (a) The following acronyms are used in this Part:
 - (1) AOC – Air Operator Certificate;
 - (2) FDP – Flight Duty Period.

³15.007 OPERATOR RESPONSIBILITIES

An operator shall:

- (a) Publish duty rosters sufficiently in advance to provide the opportunity for crew members to plan adequate rest;
- (b) Ensure that flight duty periods are planned in a way that enables crew members to remain sufficiently free from fatigue so that they can operate to a satisfactory level of safety under all circumstances;
- (c) Specify reporting times that allow sufficient time for ground duties;
- (d) Take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods;
- (e) Allocate duty patterns which avoid practices that cause a serious disruption of an established sleep/work pattern, such as alternating day/night duties;
- (f) Comply with the provisions concerning disruptive schedules in accordance with this Part;
- (g) Provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period;
- (h) Plan recurrent extended recovery rest periods and notify crew members sufficiently in advance;
- (i) Plan flight duties in order to be completed within the allowable flight duty period taking

³ This content is revised according to Item 1, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

into account the time necessary for pre-flight duties, the sector and turnaround times;

- (j) Change a schedule and/or crew arrangements if the actual operation exceeds the maximum flight duty period on more than 33% of the flight duties in that schedule during a scheduled seasonal period.

415.008 FITNESS FOR DUTY

- (a) Each crew member must report for any flight duty period rested and prepared to perform his or her assigned duties.
- (b) No operator may assign and no flight crew member may accept assignment to a flight duty period if the flight crew member has reported for a flight duty period too fatigued to safely perform his or her assigned duties.
- (c) No operator may permit a crew member to continue a flight duty period if the crew member has reported him or herself too fatigued to continue the assigned flight duty period.
- (d) As part of the dispatch or flight release, as applicable, each flight crew member must affirmatively state he or she is fit for duty prior to commencing flight.

515.010 PRESCRIPTIVE VS FATIGUE RISK MANAGEMENT

- (a) Where the operator adopts prescriptive fatigue management regulations for part of all of its operations, the CAAV may approve, in exceptional circumstances, variations to these regulations on the basis of a risk assessment provided by the operator. To be eligible for that approval, the proposed variations shall provide a level of safety equivalent to, or better than, that achieved through the prescriptive fatigue management regulations.
- (b) No operator may exceed any prescriptive requirement of this Part unless an operator-specific FRMS has been approved by the CAAV under Section 12.157 of these regulations and meets the requirements of Subpart E of this Part.

615.012 MIRRORING OF FLIGHT & CABIN CREW SCHEDULES

- (a) An operator may elect to apply the flight crew member flight duty and rest requirements to the cabin crew members without seeking separate approval from the CAAV.

15.013 RECORD KEEPING RESPONSIBILITIES

- (a) The AOC holder shall ensure that the required records for tracking flight and duty times and rest periods are maintained in a manner so that an updated record is available before crew members begins their duty day or their first flight of the day.
- (b) Every person has to comply with this aviation regulations establish maximum flight and/or duty and minimum rest periods and shall ensure that the required records have been updated to the day on which they begin duty.
- (c) ⁷An operator shall maintain, for a period of 24 months:
 - (1) Individual records for each crew member including:
 - (i) flight times;
 - (ii) start, duration and end of each duty period and FDP;
 - (iii) rest periods and days free of all duties; and

⁴ This content is added according to Item 3, Appendix XIII to Circular 03/2016/TT-BGTVT dated 31 March 2016

⁵ This content is added according to Item 4, Appendix XIII to Circular 03/2016/TT-BGTVT dated 31 March 2016

⁶ This content is revised according to Item 5, Appendix XIII to Circular 03/2016/TT-BGTVT dated 31 March 2016.

⁷ This content is added according to Item 2, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

- (iv) assigned home base.
- (2) Reports on extended flight duty periods and reduced rest periods.
- (d) ⁸Upon request, the operator shall provide copies of individual records of flight times, duty periods and rest periods to:
 - (1) the crew member concerned; and
 - (2) to another operator, in relation to a crew member who is or becomes a crew member of the operator concerned.

⁹SUBPART B: PRESCRIPTIVE FLIGHT TIME, FLIGHT DUTY PERIOD AND REST PERIOD

15.020 FLIGHT TIME SPECIFICATION SCHEMES

- (a) Operators shall establish, implement and maintain flight time specification schemes that are appropriate for the type(s) of operation performed and that comply with Vietnam Aviation Regulations.
- (b) Before being implemented, it is Operator's responsibility to ensure that flight time specification schemes including any related FRM where required are approved by CAAV.

15.023 HOME BASE

- (a) An operator shall assign a home base to each crew member.
- (b) In the case of a change of home base, the first recurrent extended recovery rest period prior to starting duty at the new home base is increased to 72 hours, including 3 local nights. Travelling time between the former home base and the new home base is positioning.

15.025 FLIGHT DUTY PERIOD - FDP

- (a) The operator shall:
 - (1) define reporting times appropriate to each individual operation taking into account operations specifications;
 - (2) establish procedures specifying how the commander shall, in case of special circumstances which could lead to severe fatigue, and after consultation with the crew members concerned, reduce the actual FDP and/or increase the rest period in order to eliminate any detrimental effect on flight safety.
- (b) Basic maximum daily FDP.
 - (1) The maximum daily FDP without the use of extensions for acclimatised crew members shall be in accordance with the following table:

Table 01: Maximum daily FDP – Acclimatised crew members

Start of FDP at reference time	1 – 2 Sectors	3 Sectors	4 Sectors	5 Sectors	6 Sectors	7 Sectors	8 Sectors	9 Sectors	10 Sectors
06:00 – 13:29	13:00	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00
13:30 – 13:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00
14:00 – 14:29	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00

⁸ This content is added according to Item 2, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

⁹ This content is revised according to Item 3, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

14:30 – 14:59	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00
15:00 – 15:29	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00
15:30 – 15:59	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00	09:00
16:00 – 16:29	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00	09:00
16:30 – 16:59	11:15	10:45	10:15	09:45	09:15	09:00	09:00	09:00	09:00
17:00 – 04:59	11:00	10:30	10:00	09:30	09:00	09:00	09:00	09:00	09:00
05:00 – 05:14	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00	09:00
05:15 – 05:29	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00	09:00
05:30 – 05:44	12:30	12:00	11:30	11:00	10:30	10:00	09:30	09:00	09:00
05:45 – 05:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15	09:00

(2) The maximum daily FDP when crew members are in an unknown state of acclimatisation shall be in accordance with the following table:

Table 02: Crew members in an unknown state of acclimatisation

Maximum daily FDP according to sectors						
1-2	3	4	5	6	7	8
11:00	10:30	10:00	09:30	09:00	09:00	09:00

(3) The maximum daily FDP when crew members are in an unknown state of acclimatisation and the operator has implemented a FRM, shall be in accordance with the following table:

Table 03: Crew members in an unknown state of acclimatisation under FRM

Maximum daily FDP according to sectors						
1-2	3	4	5	6	7	8
12:00	11:30	11:00	10:30	10:00	09:30	09:00

(c) FDP with different reporting time for flight crew and cabin crew.

Whenever cabin crew requires more time than the flight crew for their pre-flight briefing for the same sector or series of sectors, the FDP of the cabin crew may be extended by the difference in reporting time between the cabin crew and the flight crew. The difference shall not exceed 1 hour. The maximum daily FDP for cabin crew shall be based on the time at which the flight crew report for their FDP, but the FDP shall start at the reporting time of the cabin crew.

(d) Maximum daily FDP for acclimatised crew members with the use of extensions without in-flight rest.

- (1) The maximum daily FDP may be extended by up to 1 hour not more than twice in any 7 consecutive days. In that case, the minimum pre-flight and post-flight rest periods shall be increased by 2 hours; or the post-flight rest period shall be increased by 4 hours.
- (2) When extensions are used for consecutive FDPs, the additional pre- and post-flight rest between the two extended FDPs required under subparagraph 1 shall be provided consecutively.
- (3) The use of the extension shall be planned in advance, and shall be limited to a maximum of:
 - (i) 5 sectors when the WOCL is not encroached; or

- (ii) 4 sectors, when the WOCL is encroached by 2 hours or less; or
 - (iii) 2 sectors, when the WOCL is encroached by more than 2 hours.
- (4) Extension of the maximum basic daily FDP without in-flight rest shall not be combined with extensions due to in-flight rest or split duty in the same duty period.
- (5) Flight time specification schemes shall specify the limits for extensions of the maximum basic daily FDP in accordance with the certification specifications applicable to the type of operation, taking into account the number of sectors flown and WOCL encroachment.

(e) Maximum daily FDP with the use of extensions due to in-flight rest

Flight time specification schemes shall specify the conditions for extensions of the maximum basic daily FDP with in-flight rest in accordance with the certification specifications applicable to the type of operation, taking into account:

- (i) the number of sectors flown;
- (ii) the minimum in-flight rest allocated to each crew member;
- (iii) the type of in-flight rest facilities; and
- (iv) the augmentation of the basic flight crew.

(f) Unforeseen circumstances in flight operations — commander's discretion

- (1) The conditions to modify the limits on flight duty, duty and rest periods by the commander in the case of unforeseen circumstances in flight operations, which start at or after the reporting time, shall comply with the following:
- (i) the maximum daily FDP with in-flight rest may not be increased by more than 2 hours unless the flight crew has been augmented, in which case the maximum flight duty period may be increased by not more than 3 hours;
 - (ii) if on the final sector within an FDP the allowed increase is exceeded because of unforeseen circumstances after take-off, the flight may continue to the planned destination or alternate aerodrome; and
 - (iii) the rest period following the FDP may be reduced but can never be less than 10 hours.
- (2) In case of unforeseen circumstances which could lead to severe fatigue, the commander shall reduce the actual flight duty period and/or increase the rest period in order to eliminate any detrimental effect on flight safety.
- (3) The commander shall consult all crew members on their alertness levels before deciding the modifications under subparagraphs 1 and 2.
- (4) The commander shall submit a report to the operator when an FDP is increased or a rest period is reduced at his or her discretion.
- (5) Where the increase of an FDP or reduction of a rest period exceeds 1 hour, a copy of the report, to which the operator shall add its comments, shall be sent by the operator to the competent authority not later than 28 days after the event.
- (6) The operator shall implement a non-punitive process for the use of the discretion described under this provision and shall describe it in the operations manual.

(g) Unforeseen circumstances in flight operations — delayed reporting

The operator shall establish procedures, in the operations manual, for delayed reporting in the event of unforeseen circumstances, in accordance with the certification specifications applicable to the type of operation.

15.027 FLIGHT TIMES AND DUTY PERIODS

- (a) The total duty periods to which a crew member may be assigned shall not exceed:
 - (1) 60 duty hours in any 7 consecutive days;
 - (2) 110 duty hours in any 14 consecutive days;
 - (3) 190 duty hours in any 28 consecutive days, spread as evenly as practicable throughout that period.
- (b) The total flight time of the sectors on which an individual crew member is assigned as an operating crew member shall not exceed:
 - (1) 100 hours of flight time in any 28 consecutive days;
 - (2) 1000 hours of flight time in any 12 consecutive calendar months.
- (c) Post-flight duty shall count as duty period. The operator shall specify in its operations manual the minimum time period for post-flight duties.

15.029 POSITIONING

If an operator positions a crew member, the following shall apply:

- (a) Positioning after reporting but prior to operating shall be counted as FDP but shall not count as a sector;
- (b) All time spent on positioning shall count as duty period.

15.031 SPLIT DUTY

The conditions for extending the basic maximum daily FDP due to a break on the ground shall be in accordance with the following:

- (a) Flight time specification schemes shall specify the following elements for split duty in accordance with the certification specifications applicable to the type of operation:
 - (1) the minimum duration of a break on the ground;
 - (2) the possibility to extend the FDP prescribed under 15.205(b) taking into account the duration of the break on the ground, the facilities provided to the crew member to rest and other relevant factors.
- (b) The break on the ground shall count in full as FDP.
- (c) Split duty shall not follow a reduced rest.

15.033 STANDBY AND DUTIES AT THE AIRPORT

If an operator assigns crew members to standby or to any duty at the airport, the following shall apply in accordance with the certification specifications applicable to the type of operation:

- (a) Standby and any duty at the airport shall be in the roster and the start and end time of standby shall be defined and notified in advance to the crew members concerned to provide them with the opportunity to plan adequate rest.
- (b) A crew member is considered on airport standby from reporting at the reporting point until the end of the notified airport standby period.
- (c) Airport standby shall count in full as duty period.
- (d) Any duty at the airport shall count in full as duty period and the FDP shall count in full from the airport duty reporting time.
- (e) The operator shall provide accommodation to the crew member on airport standby.
- (f) Flight time specification schemes shall specify the following elements:

- (1) the maximum duration of any standby;
- (2) the impact of the time spent on standby on the maximum FDP that may be assigned, taking into account facilities provided to the crew member to rest, and other relevant factors such as:
 - (i) the need for immediate readiness of the crew member,
 - (ii) the interference of standby with sleep, and
 - (iii) sufficient notification to protect a sleep opportunity between the call for duty and the
 - (iv) assigned FDP;
- (3) the minimum rest period following standby which does not lead to assignment of an FDP;
- (4) how time spent on standby other than airport standby shall be counted for the purpose of cumulative duty periods.

15.035 RESERVE

If an operator assigns crew members to reserve, the following requirements shall apply in accordance with the certification specifications applicable to the type of operation:

- (a) Reserve shall be in the roster;
- (b) Flight time specification schemes shall specify the following elements:
 - (1) the maximum duration of any single reserve period;
 - (2) the number of consecutive reserve days that may be assigned to a crew member.

15.037 REST PERIODS

- (a) Minimum rest period at home base.
 - (1) The minimum rest period provided before undertaking an FDP starting at home base shall be at least as long as the preceding duty period, or 12 hours, whichever is greater.
 - (2) By way of derogation from point (1), the minimum rest provided under point (b) applies if the operator provides suitable accommodation to the crew member at home base.

- (b) Minimum rest period away from home base.

The minimum rest period provided before undertaking an FDP starting away from home base shall be at least as long as the preceding duty period, or 10 hours, whichever is greater. This period shall include an 8-hour sleep opportunity in addition to the time for travelling and physiological needs.

- (c) Reduced rest

By derogation from points (a) and (b), flight time specification schemes may reduce the minimum rest periods in accordance with the certification specifications applicable to the type of operation and taking into account the following elements:

- (1) the minimum reduced rest period;
 - (2) the increase of the subsequent rest period;
 - (3) the reduction of the FDP following the reduced rest.
- (d) Recurrent extended recovery rest periods

Flight time specification schemes shall specify recurrent extended recovery rest periods to compensate for cumulative fatigue. The minimum recurrent extended recovery rest

period shall be 36 hours, including 2 local nights, and in any case the time between the end of one recurrent extended recovery rest period and the start of the next extended recovery rest period shall not be more than 168 hours. The recurrent extended recovery rest period shall be increased to 2 local days twice every month.

- (e) Flight time specification schemes shall specify additional rest periods in accordance with the applicable certification specifications to compensate for:
 - (1) the effects of time zone differences and extensions of the FDP;
 - (2) additional cumulative fatigue due to disruptive schedules; and
 - (3) a change of home base.

15.039 NUTRITION

- (a) During the FDP there shall be the opportunity for a meal and drink in order to avoid any detriment to a crew member's performance, especially when the FDP exceeds 6 hours.
- (b) An operator shall specify in its operations manual how the crew member's nutrition during FDP is ensured.

15.041 FATIGUE MANAGEMENT TRAINING

The operator shall provide fatigue management training to crew members, dispatchers, personnel responsible for preparation and maintenance of crew rosters and management personnel concerned as prescribed by Part 14 of these regulations.

15.043 MIXED FLYING TYPES OF OPERATION.

- (a) No person may schedule any flight crew member and no person may accept an assignment for mixed flying types of operation, such as flight simulator, conversion/recurrent training flights prior to commercial air transport flights, except as prescribed by the CAAV.
- (b) Time carried out either in flight simulator or training flights shall be doubled for the purpose of calculating the limits of that FDP.

Note: The number of landings during flight simulator and training flights need not be taken into account.

¹⁰SUBPART C: FATIGUE RISK MANAGEMENT SYSTEMS

15.060 APPLICABILITY

- (a) This Subpart is applicable to those operators that have approved FRMS systems in lieu of, or in concert with, the prescriptive requirements of this Part.

15.063 APPROVAL OF FATIGUE RISK MANAGEMENT SYSTEM

- (a) The CAAV may approve an operator's FRMS to take the place of any or all of the prescriptive fatigue management regulations. To be eligible for that approval, the operator's proposed FRMS shall provide a level of safety equivalent to, or better than, the prescriptive fatigue management regulations.
- (b) The operator's FRMS shall establish a process to ensure that an FRMS provides a level of safety equivalent to, or better than, the prescriptive fatigue management regulations. As part of this process, the CAAV shall:

¹⁰ This content is revised according to Item 5, Appendix XIII to Circular 03/2016/TT-BGTVT dated 31 March 2016.

- (1) Require that the operator establish maximum values for flight times and/or flight duty period(s) and duty period(s), and minimum values for rest periods. These values shall be based upon scientific principles and knowledge, subject to safety assurance processes, and acceptable to the CAAV;
 - (2) Mandate a decrease in maximum values and an increase in minimum values in the event that the operator's data indicates these values are too high or too low, respectively; and
 - (3) Approve any increase in maximum values or decrease in minimum values only after evaluating the operator's justification for such changes, based on accumulated FRMS experience and fatigue-related data.
- (c) To be eligible for approval by the CAAV, the operator's FRMS to manage fatigue-related safety risks shall, as a minimum, meet the following general process requirements and the implementing requirements outlined in the Appendices 1 through 5 to 15.063:
- (1) Incorporate scientific principles and knowledge within the FRMS;
 - (2) Identify fatigue-related safety hazards and the resulting risks on an ongoing basis;
 - (3) Ensure that remedial actions, necessary to effectively mitigate the risks associated with the hazards, are implemented promptly;
 - (4) Provide a system for continuous monitoring and regular assessment of the mitigation of fatigue risks achieved by such actions; and
 - (5) Provide for performance evaluation and continuous improvement to the overall performance of the FRMS.

APPENDICES

¹¹APPENDIX 1 TO 15.025: FLIGHT DUTY PERIOD (FDP)

- (a) Night duties under the provisions of 15.025(b) and (d) comply with the following
- (1) When establishing the maximum FDP for consecutive night duties, the number of sectors is limited to 4 sectors per duty.
 - (2) The operator applies appropriate fatigue risk management to actively manage the fatiguing effect of night duties of more than 10 hours in relation to the surrounding duties and rest periods.

- (b) Extension of FDP without in-flight rest

The extension of FDP without in-flight rest under the provisions of 15.025(d)(5) is limited to the values specified in the table below:

Table 04: Maximum daily FDP with extension

Starting time of FDP	1 – 2 sectors (in hours)	3 sectors (in hours)	4 sectors (in hours)	5 sectors (in hours)
06:00 – 06:14	Not allowed	Not allowed	Not allowed	Not allowed
06:15 – 06:29	13:15	12:45	12:15	11:45
06:30 – 06:44	13:30	13:00	12:30	12:00
06:45 – 06:59	13:45	13:15	12:45	12:15
07:00 – 13:29	14:00	13:30	13:00	12:30
13:30 – 13:59	13:45	13:15	12:45	Not allowed
14:00 – 14:29	13:30	13:00	12:30	Not allowed
14:30 – 14:59	13:15	12:45	12:15	Not allowed
15:00 – 15:29	13:00	12:30	12:00	Not allowed
15:30 – 15:59	12:45	Not allowed	Not allowed	Not allowed
16:00 - 16:29	12:30	Not allowed	Not allowed	Not allowed
16:30 – 16:59	12:15	Not allowed	Not allowed	Not allowed
17:00 – 17:29	12:00	Not allowed	Not allowed	Not allowed
17:30 – 17:59	11:45	Not allowed	Not allowed	Not allowed
18:00 – 18:29	11:30	Not allowed	Not allowed	Not allowed
18:30 – 18:59	11:15	Not allowed	Not allowed	Not allowed
19:00 – 05:59	Not allowed	Not allowed	Not allowed	Not allowed

- (c) Extension of FDP due to in-flight rest

- (1) In-flight rest facilities in accordance with 15.025(e)(iii) fulfil the following minimum standards:
 - (i) ‘Class 1 rest facility’ means a bunk or other surface that allows for a flat or near flat sleeping position. It reclines to at least 80° back angle to the vertical and is located separately from both the flight crew compartment and the passenger cabin in an area that allows the crew member to control light, and provides isolation from noise and disturbance;

¹¹ This content is added according to Item 7, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

- (ii) ‘Class 2 rest facility’ means a seat in an aircraft cabin that reclines at least 45° back angle to the vertical, has at least a pitch of 55 inches (137,5 cm), a seat width of at least 20 inches (50 cm) and provides leg and foot support. It is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or crew members;
 - (iii) ‘Class 3 rest facility’ means a seat in an aircraft cabin or flight crew compartment that reclines at least 40° from the vertical, provides leg and foot support and is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is not adjacent to any seat occupied by passengers.
- (2) The extension of FDP with in-flight rest under the provisions of 15.025 (e) complies with the following:
- (i) the FDP is limited to 3 sectors; and
 - (ii) the minimum in-flight rest period is a consecutive 90-minute period for each crew member and 2 consecutive hours for the flight crew members at control during landing.
- (3) The maximum daily FDP under the provisions of 15.025 (e) may be extended due to in-flight rest for flight crew:
- (i) with one additional flight crew member:
 - (A) up to 14 hours with class 3 rest facilities;
 - (B) up to 15 hours with class 2 rest facilities;
 - (C) up to 16 hours with class 1 rest facilities;
 - (ii) with two additional flight crew members:
 - (A) up to 15 hours with class 3 rest facilities;
 - (B) up to 16 hours with class 2 rest facilities;
 - (C) up to 17 hours with class 1 rest facilities.
- (4) The minimum in-flight rest for each cabin crew member is:

Table 05: Minimum in-flight rest for each cabin crew member

Maximum extended FDP	Minimum in-flight rest (hours)		
	Class 1	Class 2	Class 3
Up to 14:30 hours	01:30	01:30	01:30
14:31 – 15:00 hours	01:45	02:00	02:20
15:01 – 15:30 hours	02:00	02:20	02:40
15:31 – 16:00 hours	02:15	02:40	03:00
16:01 – 16:30 hours	02:35	03:00	Not allowed
16:31 – 17:00 hours	03:00	03:25	Not allowed
17:01 – 17:30 hours	03:25	Not allowed	Not allowed
17:31 – 18:00 hours	03:50	Not allowed	Not allowed

- (5) The limits specified in (2) may be increased by 1 hour for FDPs that include 1 sector of more than 9 hours of continuous flight time and a maximum of 2 sectors;
- (6) All time spent in the rest facility is counted as FDP;

- (7) The minimum rest at destination is at least as long as the preceding duty period, or 14 hours, whichever is greater;
 - (8) A crew member does not start a positioning sector to become part of this operating crew on the same flight.
- (d) Unforeseen circumstances in flight operations — delayed reporting
- (1) The operator may delay the reporting time in the event of unforeseen circumstances, if procedures for delayed reporting are established in the operations manual. The operator keeps records of delayed reporting. Delayed reporting procedures establish a notification time allowing a crew member to remain in his/her suitable accommodation when the delayed reporting procedure is activated. In such a case, if the crew member is informed of the delayed reporting time, the FDP is calculated as follows:
 - (i) one notification of a delay leads to the calculation of the maximum FDP according to (iii) or (iv);
 - (ii) if the reporting time is further amended, the FDP starts counting 1 hour after the second notification or at the original delayed reporting time if this is earlier;
 - (iii) when the delay is less than 4 hours, the maximum FDP is calculated based on the original reporting time and the FDP starts counting at the delayed reporting time;
 - (iv) when the delay is 4 hours or more, the maximum FDP is calculated based on the more limiting of the original or the delayed reporting time and the FDP starts counting at the delayed reporting time;
 - (v) as an exception to (i) and (ii), when the operator informs the crew member of a delay of 10 hours or more in reporting time and the crew member is not further disturbed by the operator, such delay of 10 hours or more counts as a rest period.
- (e) Operator procedures for delayed reporting should:
- (1) specify a contacting mode;
 - (2) establish minimum and maximum notification times;
 - (3) avoid interference with sleeping patterns when possible.

¹²APPENDIX 2 TO 15.025: ALLOWABLE FLIGHT DUTY PERIOD - SINGLE PILOT.

- (a) The maximum allowable FDP may be extended for single-pilot operations as provided in the following table:

Table 06: Reporting time

Reporting time	Number of landings as operating flight crew member		
	1 - 4	5	>=6
07:00 - 17:59	09:30 hours	08:30 hours	08:00 hours
18:00- 21:59	08:30 hours	08:00 hours	08:00 hours
22:00 - 04:59	08:00 hours	08:00 hours	08:00 hours
05:00 - 06:59	08:30 hours	08:00 hours	08:00 hours

¹² This content is revised according to Item 7, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

- (b) For flights operated by a single pilot and conducted wholly under VFR, allowable FDPs must be derived from first column (column addressing 1-4 landings).
 - (1) This although, in this case, there is no limit to the number of landings;
 - (2) Where the number of landings exceeds an average of 4 per hour, a break of at least 30 minutes must be taken within any period of 3 consecutive hours.

¹³APPENDIX 2 TO 15.031: SPLIT DUTY

The increase of limits on flight duty, under the provisions of 15.031, complies with the following:

- (a) The break on the ground within the FDP has a minimum duration of 3 consecutive hours.
- (b) The break excludes the time allowed for post and pre-flight duties and travelling. The minimum total time for post and pre-flight duties and travelling is 30 minutes. The operator specifies the actual times in its operations manual taking into account aircraft type, type of operation and airport conditions.
- (c) The maximum FDP specified in 15.025 (b) may be increased by up to 50 % of the break.
- (d) Suitable accommodation is provided either for a break of 6 hours or more or for a break that encroaches the window of circadian low (WOCL).
- (e) In all other cases:
 - (1) accommodation is provided;
 - (2) any time of the actual break exceeding 6 hours or any time of the break that encroaches the WOCL does not count for the extension of the FDP.
- (f) Split duty cannot be combined with in-flight rest

¹⁴APPENDIX 1 TO 15.033: STANDBY

The modification of limits on flight duty, duty and rest periods under the provisions of 15.233 complies with the following:

- (a) Airport standby
 - (1) If not leading to the assignment of an FDP, airport standby is followed by a rest period as specified in 15.037.
 - (2) If an assigned FDP starts during airport standby, the following applies:
 - (i) the FDP counts from the start of the FDP. The maximum FDP is reduced by any time spent on standby in excess of 4 hours;
 - (ii) the maximum combined duration of airport standby and assigned FDP as specified in 15.025 (b) and (d) is 16 hours.
- (b) Standby other than airport standby:
 - (1) the maximum duration of standby other than airport standby is 16 hours;
 - (2) The operator's standby procedures are designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time;
 - (3) 25 % of time spent on standby other than airport standby counts as duty time for the purpose of 15.027;
 - (4) standby is followed by a rest period in accordance with 15.037;
 - (5) standby ceases when the crew member reports at the designated reporting point;

¹³ This content is revised according to Item 8, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

¹⁴ This content is revised according to Item 9, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

- (6) if standby ceases within the first 6 hours, the maximum FDP counts from reporting;
- (7) if standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;
- (8) (8) if the FDP is extended due to in-flight rest according to Appendix 1 to 15.025 (c), or to split duty according to Appendix 1 to 15.031, the 6 hours of paragraph (6) and (7) are extended to 8 hours;
- (9) if standby starts between 23:00 and 07:00, the time between 23:00 and 07:00 does not count towards the reduction of the FDP under (6), (7) and (8) until the crew member is contacted by the operator;
- (10) the response time between call and reporting time established by the operator allows the crew member to arrive from his/her place of rest to the designated reporting point within a reasonable time.

¹⁵APPENDIX 1 TO 15.035: RESERVE

The operator assigns duties to a crew member on reserve under the provisions of 15.035 complying with the following:

- (a) An assigned FDP counts from the reporting time.
- (b) Reserve times do not count as duty period for the purpose of 15.025 and 15.037.
- (c) The operator defines the maximum number of consecutive reserve days within the limits of 15.037(d).
- (d) To protect an 8-hour sleep opportunity, the operator rosters a period of 8 hours, taking into account fatigue management principles, for each reserve day during which a crew member on reserve is not contacted by the operator.

¹⁶APPENDIX 1 TO 15.035: REST PERIODS

- (a) Disruptive schedules
 - (1) If a transition from a late finish/night duty to an early start (before 08am local time) is planned at home base, the rest period between the 2 FDPs includes 1 local night;
 - (2) If a crew member performs 4 or more night duties, early starts or late finishes between 2 extended recovery rest periods as defined in 15.037(d), the second extended recovery rest period is extended to 60 hours.
- (b) Time zone differences
 - (1) For the purpose of 15.037(e)(1), 'rotation' is a series of duties, including at least one flight duty, and rest period out of home base, starting at home base and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member;
 - (2) The operator monitors rotations and combinations of rotations in terms of their effect on crew member fatigue, and adapts the rosters as necessary;
 - (3) Time zone differences are compensated by additional rest, as follows:
 - (i) At home base, if a rotation involves a 4 hour time difference or more, the minimum rest is as specified in the following table.

Table 07: Minimum local nights of rest at home base to compensate for time zone differences

¹⁵ This content is added according to Item 11, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

¹⁶ This content is revised according to Item 12, Appendix XI to Circular 21/2017/TT-BGTVT dated 30 Jun 2017

Maximum time difference (h) between reference time and local time where a crew member rests during a rotation	Time elapsed (h) since reporting for the first FDP in a rotation involving at least 4-hour time difference to the reference time			
	< 48	48 – 71:59	72 – 95:59	≥ 96
≤6	2	2	3	3
> 6 and ≤ 9	2	3	3	4
> 9 and ≤ 12	2	3	4	5

- (ii) Away from home base, if an FDP involves a 4-hour time difference or more, the minimum rest following that FDP is at least as long as the preceding duty period, or 14 hours, whichever is greater.

By way of derogation from point (b)(3)(i) and only once between 2 recurrent extended recovery rest periods as specified in 15.037(d), the minimum rest provided under this point (b)(3)(ii) may also apply to home base if the operator provides suitable accommodation to the crew member;

- (4) In case of an Eastward-Westward or Westward-Eastward transition, at least 3 local nights of rest at home base are provided between alternating rotations.
- (5) The monitoring of combinations of rotations is conducted under the operator's management system provisions.

(c) Reduced rest

- (1) The minimum reduced rest periods under reduced rest arrangements are 12 hours at home base and 10 hours out of base;
- (2) Reduced rest is used under Operator's fatigue risk management program;
- (3) The rest period following the reduced rest is extended by the difference between the minimum rest period specified in 15.037 (a) or (b) and the reduced rest;
- (4) The FDP following the reduced rest is reduced by the difference between the minimum rest periods specified in 15.037 (a) or (b) as applicable and the reduced rest;
- (5) There is a maximum of 2 reduced rest periods between 2 recurrent extended recovery rest periods specified in accordance with 15.035 (d).

¹⁷APPENDIX 1 TO 15.063: FRMS POLICY

- (a) A Fatigue Risk Management System (FRMS) established in accordance with this Part shall contain, at a minimum:
- (1) The operator shall define its FRMS policy, with all elements of the FRMS clearly identified.
- (2) The policy shall require that the scope of FRMS operations be clearly defined in the operations manual.
- (b) The policy shall:
- (1) Reflect the shared responsibility of management, flight and cabin crews, and other involved personnel;
- (2) Clearly state the safety objectives of the FRMS;
- (3) Be signed by the accountable executive of the organization;

¹⁷ This content is added according to Item 19, Appendix XIII to Circular 03/2016/TT-BGTVT dated 31 March 2016.

- (4) Be communicated, with visible endorsement, to all the relevant areas and levels of the organization;
- (5) Declare management commitment to effective safety reporting;
- (6) Declare management commitment to the provision of adequate resources for the FRMS;
- (7) Declare management commitment to continuous improvement of the FRMS;
- (8) Require that clear lines of accountability for management, flight and cabin crews, and all other involved personnel are identified; and
- (9) Require periodic reviews to ensure it remains relevant and appropriate.

APPENDIX 2 TO 15.063: FRMS DOCUMENTATION

- (a) An operator shall develop and keep current FRMS documentation that describes and records:
 - (1) FRMS policy and objectives;
 - (2) FRMS processes and procedures;
 - (3) Accountabilities, responsibilities and authorities for these processes and procedures;
 - (4) Mechanisms for ongoing involvement of management, flight and cabin crew members, and all other involved personnel;
 - (5) FRMS training programmes, training requirements and attendance records;
 - (6) Scheduled and actual flight times, duty periods and rest periods with significant deviations and reasons for deviations noted; and
- (b) FRMS outputs including findings from collected data, recommendations, and actions taken.

APPENDIX 3 TO 15.063: FATIGUE RISK MANAGEMENT PROCESSES

- (a) An operator shall develop and maintain three fundamental and documented processes for fatigue hazard identification:
 - (1) The predictive process shall identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include but are not limited to:
 - (i) Operator or industry operational experience and data collected on similar types of operations;
 - (ii) Evidence-based scheduling practices; and
 - (iii) Bio-mathematical models.
 - (2) The proactive process shall identify fatigue hazards within current flight operations. Methods of examination may include but are not limited to:
 - (i) Self-reporting of fatigue risks;
 - (ii) Crew fatigue surveys;
 - (iii) Relevant flight and cabin crew performance data;
 - (iv) Available safety databases and scientific studies; and
 - (v) Analysis of planned versus actual time worked.
 - (3) The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to

determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:

- (i) Fatigue reports;
 - (ii) Confidential reports;
 - (iii) Audit reports;
 - (iv) Incidents; and
 - (v) Flight data analysis events.
- (b) An operator shall develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation. The risk assessment procedures shall review identified hazards and link them to:
- (1) Operational processes;
 - (2) Their probability;
 - (3) Possible consequences; and
 - (4) The effectiveness of existing safety barriers and controls.
- (c) An operator shall develop and implement risk mitigation procedures that:
- (1) Select the appropriate mitigation strategies;
 - (2) Implement the mitigation strategies; and
 - (3) Monitor the strategies' implementation and effectiveness.

APPENDIX 4 TO 15.063: FRMS SAFETY ASSURANCE PROCESSES

- (a) The operator shall develop and maintain FRMS safety assurance processes to:
- (1) Provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:
 - (i) Hazard reporting and investigations; (ii) Audits and surveys; and
 - (ii) Reviews and fatigue studies;
 - (2) Provide a formal process for the management of change which shall include but is not limited to:
 - (i) Identification of changes in the operational environment that may affect FRMS;
 - (ii) Identification of changes within the organization that may affect FRMS; and
 - (iii) Consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and
 - (3) Provide for the continuous improvement of the FRMS. This shall include but is not limited to:
 - (i) The elimination and/or modification of risk controls that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;
 - (ii) Routine evaluations of facilities, equipment, documentation and procedures; and
 - (iii) The determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

APPENDIX 5 TO 15.063: FRMS PROMOTION PROCESSES

- (a) FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels.
- (b) The following shall be established and implemented by the operator as part of its FRMS:
 - (1) Training programs to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew, and all other involved personnel under the planned FRMS; and
 - (2) An effective FRMS communication plan that:
 - (i) Explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and
 - (ii) Describes communication channels used to gather and disseminate FRMS-related information.