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### FLIGHT CREW FATIGUE AND FLIGHT TIME LIMITATIONS

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FLIGHT CREW FATIGUE AND FLIGHT TIME LIMITATIONSPART I - COMPENDIUM OF REGULATIONSFOREWORD

1. Annex 6 to the Convention on International Civil Aviation, which deals with the "Operation of Aircraft" in "International Commercial Air Transport", attempts to define a minimum acceptable level of safety for such operations. To this end it specifies the type of operating supervision which must be provided, certain basic operational procedures which must be followed, the basic duties of certain flight crew members, the types of radio and emergency equipment which must be carried, etc. Since one of the more important considerations pertaining to the safety of an aircraft operation is the proficiency of the crew, Annex 1 specifies that each flight crew member shall have demonstrated his general proficiency in obtaining an appropriate licence, and Annex 6 specifies that this shall be supplemented by additional training and checking both to ensure the maintenance of this proficiency and to ensure continuing familiarity with the types of aircraft used and the routes flown.

2. While such measures help to ensure a high state of competence of flight crew members, the effectiveness with which this competence is available for use depends upon each crew member's being sufficiently well rested to utilize his capabilities efficiently. Otherwise he may not respond as though proficient, but may make errors of judgment or action such as are associated with much lower degrees of proficiency than he has attained. This effect can be aggravated by various combinations of unfavourable operational circumstances, but the continuation of any task long enough under even the most favourable circumstances will ultimately produce fatigue and consequent loss of efficiency. The objective of current studies is therefore not only to assess the aggravating effect of various contributing factors, but also to determine the maximum flight time that should be allowed as a general rule.

3. As no reliable objective indices of fatigue are at present available from which to determine comparative degrees of fatigue accurately, rough approximations of the times involved in becoming tired enough to have clearly passed beyond the threshold of acceptable efficiency have so far had to suffice. Flying duties themselves can be a cause of fatigue if the duration to which one is exposed to them is excessive and duration of exposure can be and is used as one of the basic limitations designed to minimize fatigue. While such limitations are intended primarily to account for this single factor, it is noted that in many instances an attempt has been made to account for various other contributing factors by incorporating various types of exceptions and qualifying statements. As a result, there is considerable variation in the form and content of regulations adopted by States. In general, existing regulations specify the maximum periods of time during which flight personnel may be exposed to conditions most likely to induce fatigue, these periods being variously expressed in terms of hours of duty, or hours of flight time (scheduled or planned), and they are generally supplemented by corresponding requirements for periods of rest. Regulations apply variously to the complete crew, the flight crew only, or to pilots and other members of the flight crew separately.

4. With a view to acquainting all States with the types of flight time limitations now in force, the Air Navigation Commission decided that a Circular should be issued, containing a compilation of the current regulations of Contracting States, and those established by operators and approved by their States.

5. The regulations reproduced in this Circular indicate the manner in which various States at the time of issuance of the Circular have implemented the Standard in 4.2.7.4 of Annex 6. This Standard specifies that each State shall ensure that its operators establish limitations on the flight time of flight crew members, to ensure that fatigue does not endanger the safety of a flight. It also specifies that all such regulations be approved by the State of Registry. The publication of the regulations in this Circular does not indicate that ICAO endorses either the form or content of any of the regulations. The material contained herein is provided primarily for the information of Contracting States.

6. It will be noted that there is considerable variation both in the manner in which the regulations contained herein are stated, their scope and their applicability. In some cases regulations are developed and issued by a State while in others an operator is permitted to develop detailed regulations, which must be submitted to the State for approval. Some regulations apply to pilots only, others to flight crew and some cover all crew members. In this connection it should be noted that in Annex 6 a "crew member" is defined as a person assigned by an operator to duty on an aircraft during flight time, and that a "flight crew member" is defined as a licensed crew member charged with duties essential to the operation of an aircraft during flight time. Paragraph 4.2.7.4 of Annex 6 applies only to "flight crew members".

7. Indicative of the fact that "flight time" is only one of several factors which can contribute to fatigue are those regulations by States which differentiate between the types of aircraft used, types of routes and general operating conditions encountered on routes. With a view to providing a general overall picture of the manner in which regulations are developed and applied, Table I has been prepared indicating the scope of such regulations and their applicability. In it the designators A to H have the following meaning.

Origin of Regulations	<ul style="list-style-type: none"> <li>A - Regulations are developed and issued by the State.</li> <li>B - Regulations are developed by an operator and are submitted to the State for approval.</li> </ul>
Types of crew members covered	<ul style="list-style-type: none"> <li>C - The regulations apply to all "crew members".</li> <li>C* - The regulations as a whole cover all "crew members" but various categories are treated separately.</li> <li>D - The regulations apply to all "flight crew members".</li> <li>D* - The regulations apply to all "flight crew members" but various categories are treated separately.</li> <li>E - The regulations apply to "pilots" only.</li> </ul>
Types of operations covered	<ul style="list-style-type: none"> <li>F - The regulations apply to scheduled operations.</li> <li>F* - The regulations apply to scheduled operations but differ in some respects from those applicable to other types of operations.</li> <li>G - The regulations apply to non-scheduled operations.</li> <li>G* - The regulations apply to non-scheduled operations but differ in some respects from those applicable to other types of operations.</li> <li>H - The regulations apply to all commercial flying, i. e. scheduled, non-scheduled, aerial work, etc.</li> </ul>

TABLE 1

STATE	Origin of Regulations		Types of Crew Members Covered			Types of Operations Covered		
	A	B	C	D	E	F	G	H
AFGHANISTAN								
ARGENTINA	0		0					0
AUSTRALIA	0			*				0
AUSTRIA								
BELGIUM	0				0			
BELGIAN CONGO	0			*				0
BOLIVIA								
BRAZIL	0		*			0	0	
BURMA	0				0			0
CANADA		0		0		0	0	
CEYLON	0				0			0
CHILE								
CHINA								
COLOMBIA								
CUBA								
CZECHOSLOVAKIA								
DENMARK		0		0		0	0	
DOMINICAN REPUBLIC								
ECUADOR								
EGYPT	0				0	0	0	
EL SALVADOR								
ETHIOPIA								

\* Various categories of crew member or types of operation are treated differently.

STATE	Origin of Regulations		Types of Crew Members Covered			Types of Operations Covered		
	A	B	C	D	E	F	G	H
FINLAND	0				0	*	*	
FRANCE	0		*					0
GREECE	0		0					0
GUATEMALA								
HAITI								
HASHEMITE JORDAN								
HONDURAS	0			0				0
ICELAND								
INDIA								
INDONESIA								
IRAN								
IRAQ								
IRELAND		0		0				0
ISRAEL	0	0		*				*
ITALY								
JAPAN		0		0				*
KOREAN REPUBLIC								
LAOS								
LEBANON	0		0					0
LIBERIA								
LIBYA								
LUXEMBOURG								
MEXICO	0			0				
NETHERLANDS		0	*			0	0	
NEW ZEALAND	0			*		0	0	

\* Various categories of crew member or types of operation are treated differently.

STATE	Origin of Regulations		Types of Crew Members Covered			Types of Operations Covered		
	A	B	C	D	E	F	G	H
NICARAGUA								
NORWAY								
PAKISTAN	0		*					0
PARAGUAY								
PERU								
PHILIPPINE REPUBLIC	0			*				*
POLAND								
PORTUGAL		0	*					*
SPAIN		0		0				0
SWEDEN		0		0		0	0	
SWITZERLAND		0		0		0		
SYRIA								
THAILAND								
TURKEY		0		0		0		
UNION OF S. AFRICA	0			0				
UNITED KINGDOM								
UNITED STATES	0			*		*	*	
URUGUAY								
VENEZUELA								
VIETNAM								

\* Various categories of crew member or types of operation are treated differently.



ARGENTINAApplicability of Regulations

Regulations are issued by the State and apply to all crew members on all types of commercial operations.

Regulations

The maximum flight times which may be assigned to airline crew members shall be as indicated hereunder and shall depend upon the type of aircraft used:

## a) DC-6 aircraft with pressurized cabins and supplemented crews:

Not more than 130 hours per month;  
360 hours per quarter;  
1200 hours per annum.

## b) DC-4 aircraft:

Not more than 40 hours per week;  
120 hours per month;  
300 hours per quarter;  
1000 hours per annum.

## c) Convair 240 aircraft with pressurized cabins:

Not more than 100 hours per month;  
260 hours per quarter;  
900 hours per annum.

## d) Sandringham seaplanes and DC-3 aircraft:

Not more than 12 hours daily on the basis of airline schedules, with a rest period which shall be at least equal to twice the hours flown since the previous rest period, and in no case less than 12 hours. During rest periods crews shall be relieved of all duties.

Not more than 100 hours per month;  
240 hours per quarter;  
800 hours per annum.

When the tour of duty exceeds 12 hours per day, no more than 14 hours on the basis of airline schedules shall be flown and the crew shall include 1 additional pilot and 1 additional radio-operator. In such cases the hours flown by members of reinforced crews in excess of the basic 12 hours per day shall be logged separately up to an annual maximum of 50 hours which when added to the maximum basic flight time of 800 hours shall not exceed a total of 850 hours per annum.

(An operator) through its Medical Department shall maintain close watch on the activities of its flight personnel in order to avoid risks resulting from fatigue, irrespective of the number of hours flown or the type of operation or the nature of the duty involved. To this end (an operator) shall continue to maintain permanent liaison with the Health Department of this under-Secretariat which shall prepare bi-monthly reports on this subject and communicate ad hoc any information important enough to require a report.

For the purposes of this Order flight time shall be counted from the moment at which the crew is "on duty", it being understood that if the crew is required to report one hour in advance of flight time in order to prepare its flight plans etc., this time shall be counted as "duty".

AUSTRALIAApplicability of Regulations

Regulations which are issued by the State cover all flight crew members and apply to all types of commercial operations. Each category of flight crew member is treated separately and flight time limitations vary according to the composition of the flight crew.

48.0 Flight Time Limitations - General48.0.1 Authority

This Part 48 of Air Navigation Orders is issued by the Director-General of Civil Aviation in pursuance of the powers vested in him by the Air Navigation Regulations.

48.0.2 Application

These Orders shall apply to all aerial work, charter and regular public transport air service operations.

48.0.3 Definitions

**Adequate rest facilities:** Rest facilities considered by the Director-General to provide suitable rest in flight for resting flight crew members.

**Flight time:** The total time from the moment at which an aeroplane first moves under its own power for the purpose of taxiing out for take-off until the moment its engines are stopped at the destination or intermediate stopping place after landing.

**Waiting time:** All time spent during a tour of duty by a flight crew member, on duty of any nature associated with his employment prior to departure on a flight, on the ground at intermediate stopping places and after arrival at the destination aerodrome of that tour of duty.

**Tour of duty:** The period between the time a flight crew member commences any duties associated with his employment prior to making a particular flight or series of flights until he is finally relieved of all such duties after the termination of such flight or series of flights.

**Flight crew member:** A licensed crew member charged with duties essential to the operation of an aircraft during flight time.

**Rest period:** A period of time during which a flight crew member is relieved of all duties associated with his employment.

48.0.4 General Conditions

48.0.4.1 A tour of duty shall always be preceded by a rest period on the ground of at least:

a) nine consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or

b) ten consecutive hours.

48.0.4.2 Time spent in deadhead transportation shall not be considered as part of a rest period.

48.0.4.3 Waiting time shall not be logged as aeronautical experience.

48.0.4.4 Waiting time accumulated during a tour of duty shall be used only for the purpose of the calculation of flight time for that particular tour of duty and shall not be used in determining weekly, monthly or yearly flight time.

48.0.4.5 A pilot shall not exceed the flight time limitations specified in Subsection 48.1.1 unless all flying is carried out as a member of a crew consisting of three or more flight crew members.

48.0.4.6 Where these Orders require the provision of adequate rest facilities in the aeroplane, the pilot in command shall prepare a schedule of rest periods for the flight crew and he shall ensure that the flight crew do in fact take their rest at the periods so scheduled.

48.0.4.7 Where the flight crew is composed of combinations of licensed flight crew members other than as specified in these Orders, the flight time limitations which shall apply shall be determined by the Director-General on application by the operator concerned.

#### 48.0.5 Variations and Dispensations

48.0.5.1 Having regard to factors such as:

- a) accommodation available at designated stopping places;
- b) route to be flown and number of landings;
- c) time of day of the flight;
- d) flight rules applicable;
- e) aeroplane details such as:
  - i) type of aeroplane;
  - ii) number of operating crew;
  - iii) whether fitted with automatic pilot;
  - iv) pressurized or non-pressurized;
- f) return to home base;
- g) any other conditions having a bearing on the safety of the operations concerned;

the Director-General may permit variation of the daily or weekly totals specified in these Orders.

48.0.5.2 Any dispensation given in accordance with the provisions of paragraph 48.0.5.1 may include such special requirements as the Director-General considers necessary having regard to the circumstances.

#### 48.1 Flight Time Limitations - Pilots

##### 48.1.1 Limitations where the flight crew consists of one or two pilots only

Each pilot of an aeroplane in which the flight crew consists of one or two pilots only shall be subject to the limitations specified in this subsection.

48.1.1.1 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of eight hours in any one tour of duty.

48.1.1.1A When a pilot has commenced a tour of duty in accordance with paragraph 48.1.1.1 and, due to unforeseen circumstances, the flight time exceeds the limitation specified in that paragraph:

- a) He may fly in excess of eight hours but not more than nine hours, in which case he shall have, at the completion of this tour of duty, a rest period on the ground of not less than:

i) nine consecutive hours, which shall include the hours between 10 p.m. and 6 a.m. local time, plus one additional hour for each fifteen minutes or part thereof by which his flight time exceeded eight hours, or

ii) ten consecutive hours plus one additional hour for each fifteen minutes or part thereof by which his flight time exceeded eight hours.

b) He may fly, in excess of nine hours but not more than ten hours, in which case he shall have, at the completion of his tour of duty, a rest period on the ground of at least 24 consecutive hours.

48.1.1.2 He may fly, and an operator may permit him to fly, as a flight crew member in excess of eight hours in any 24 consecutive hours, in which case he shall have a rest period on the ground of not less than:

a) nine consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or,

b) ten consecutive hours,

at or before the completion but after the commencement of the first eight hours flight time.

48.1.1.3 When he has flown as a flight crew member in excess of eight hours in any 24 consecutive hours in accordance with the provisions of paragraph 48.1.1.2 he shall have a rest period on the ground of:

a) at least 12 consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or

b) at least 24 consecutive hours.

48.1.1.4 In calculating flight time for the purpose of the limitations specified in paragraphs 48.1.1.1, 48.1.1.1A, 48.1.1.2 and 48.1.1.3, all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.1.1.5 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 30 hours in any seven consecutive days.

48.1.1.6 He shall be relieved of all duties associated with his employment for a continuous period of at least 24 hours in each period of seven days and so as to ensure that he does not perform those duties at any time on more than six consecutive days.

48.1.1.7 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 105 hours in any 30 consecutive days.

48.1.1.8 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 300 hours in any 90 consecutive days.

48.1.1.9 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

#### 48.1.2 Limitations where the flight crew consists of three pilots

Each pilot of an aeroplane in which the flight crew consists of three pilots of whom at least two are licensed to act as pilot-in-command for the particular class of operation irrespective as to whether other flight crew members are carried, shall be subject to the limitations specified in this subsection.

48.1.2.1 He may fly, and an operator may permit him to fly, as a flight crew member on a tour of duty not exceeding 30 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane.

48.1.2.2 When he has completed a tour of duty as outlined in paragraph 48.1.2.1 he shall have a rest period on the ground of not less than 24 consecutive hours.

48.1.2.3 He may fly, and an operator may permit him to fly, tours of duty as a flight crew member of more than 12 hours but less than 24 hours with an intervening rest period on the ground of not less than 12 consecutive hours after each tour of duty where adequate rest facilities are provided in the aeroplane. The total hours flown in any such tours of duty shall not exceed 60 hours without the pilot having a rest period on the ground of not less than 24 consecutive hours.

48.1.2.4 In calculating hours for the purpose of the limitations specified in paragraph 48.1.2.3, all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.1.2.5 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 350 hours in any 90 consecutive days.

48.1.2.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

#### 48.3 Flight Time Limitations - Flight Navigators

##### 48.3.1 Limitations where the flight crew includes one flight navigator

A flight navigator of an aeroplane which carries only one flight navigator shall be subject to the limitations specified in this subsection.

48.3.1.1 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 12 hours in any one tour of duty.

48.3.1.2 He may fly, and an operator may permit him to fly, as a flight crew member in excess of 12 hours in any 24 consecutive hours provided that he has a rest period on the ground of not less than:

a) nine consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or

b) ten consecutive hours;

at or before the completion of the first 12 hours flight time.

48.3.1.3 When he has flown as a flight crew member in accordance with the provisions of paragraph 48.3.1.1 for 20 hours or more in any 48 consecutive hours or 24 hours or more in any 72 consecutive hours he shall have a rest period on the ground of not less than 24 consecutive hours.

48.3.1.4 In calculating flight time for the purpose of paragraphs 48.3.1.1, 48.3.1.2 and 48.3.1.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.3.1.5 He shall be relieved of all duties associated with his employment for a continuous period of at least 24 hours in each period of seven days and so as to ensure that he does not perform those duties at any time on more than six consecutive days.

48.3.1.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 120 hours in any 30 consecutive days or in excess of 350 hours in any 90 consecutive days.

48.3.1.7 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

48.3.2 Limitations where the flight crew includes two flight navigators

Each flight navigator of an aeroplane in which the flight crew includes two flight navigators shall be subject to the limitations specified in this subsection.

48.3.2.1 He may fly, and an operator may permit him to fly, as a flight crew member a tour of duty not exceeding 30 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane.

48.3.2.2 When he has completed a tour of duty as outlined in paragraph 48.3.2.1 he shall have a rest period on the ground of not less than 24 consecutive hours.

48.3.2.3 He may fly as a flight crew member tours of duty of more than 12 hours but less than 24 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane. The total hours flown in any such series shall not exceed 60 hours without his having a rest period on the ground of not less than 24 consecutive hours.

48.3.2.4 In calculating hours for the purpose of paragraph 48.3.2.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.3.2.5 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 350 hours in any 90 consecutive days.

48.3.2.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

48.4 Flight Time Limitations - Flight Radio Operators

48.4.1 Limitations where the flight crew includes one flight radio operator

A flight radio operator of an aeroplane which carries only one flight radio operator shall be subject to the limitations specified in this subsection.

48.4.1.1 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 12 hours in any one tour of duty.

48.4.1.2 He may fly, and an operator may permit him to fly, as a flight crew member in excess of 12 hours in any 24 consecutive hours provided that he has a rest period on the ground of not less than:

a) nine consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or

b) ten consecutive hours;

at or before the completion of the first 12 hours of flight time.

48.4.1.3 When he has flown as a flight crew member in accordance with the provisions of paragraph 48.4.1.1 for 20 hours or more in any 48 consecutive hours or 24 hours or more in any 72 consecutive hours he shall have a rest period on the ground of not less than 24 consecutive hours.

48.4.1.4 In calculating flight time for the purpose of paragraphs 48.4.1.1, 48.4.1.2 and 48.4.1.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.4.1.5 He shall be relieved of all duties associated with his employment for a continuous period of at least 24 hours in each period of seven days and so as to ensure that he does not perform those duties at any time on more than six consecutive days.

48.4.1.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 120 hours in any 30 consecutive days or in excess of 350 hours in any 90 consecutive days.

48.4.1.7 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

#### 48.4.2 Limitations where the flight crew includes two flight radio operators

Each flight radio operator of an aeroplane in which the flight crew includes two flight radio operators shall be subject to the limitations specified in this subsection.

48.4.2.1 He may fly, and an operator may permit him to fly, as a flight crew member on a tour of duty not exceeding 30 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane.

48.4.2.2 When he has completed a tour of duty as outlined in paragraph 48.4.2.1 he shall have a rest period on the ground of not less than 24 consecutive hours.

48.4.2.3 He may fly, and an operator may permit him to fly, as a flight crew member on tours of duty of more than 12 hours but less than 24 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane. The total hours flown in any such series shall not exceed 60 hours without his having a rest period on the ground of not less than 24 consecutive hours.

48.4.2.4 In calculating hours for the purpose of paragraph 48.4.2.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.4.2.5 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 350 hours in any 90 consecutive days.

48.4.2.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

#### 48.5 Flight Time Limitations - Flight Engineers

##### 48.5.1 Limitations where the flight crew includes one flight engineer

A flight engineer of an aeroplane which carries only one flight engineer shall be subject to the limitations specified in this subsection.

48.5.1.1 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 12 hours in any one tour of duty.

48.5.1.2 He may fly, and an operator may permit him to fly, as a flight crew member in excess of 12 hours in any 24 consecutive hours provided that he has a rest period on the ground of not less than:

a) nine consecutive hours which shall include the hours between 10 p.m. and 6 a.m. local time, or

b) ten consecutive hours;

at or before the completion of the first 12 hours of flight time.

48.5.1.3 When he has flown as a flight crew member in accordance with the provisions of paragraph 48.5.1.1 for 20 hours or more in any 48 consecutive hours or 24 hours or more in any 72 consecutive hours he shall have a rest period on the ground of not less than 24 consecutive hours.

48.5.1.4 In calculating flight time for the purpose of paragraphs 48.5.1.1, 48.5.1.2 and 48.5.1.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.5.1.5 He shall be relieved of all duties associated with his employment for a continuous period of at least 24 hours in each period of seven days and so as to ensure that he does not perform those duties at any time on more than six consecutive days.

48.5.1.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 120 hours in any 30 consecutive days or in excess of 350 hours in any 90 consecutive days.

48.5.1.7 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.

48.5.2 Limitations where the flight crew includes two flight engineers

Each flight engineer of an aeroplane in which the flight crew includes two flight engineers shall be subject to the limitations specified in this subsection.

48.5.2.1 He may fly, and an operator may permit him to fly, as a flight crew member a tour of duty not exceeding 30 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane.

48.5.2.2 When he has completed a tour of duty as outlined in paragraph 48.5.2.1 he shall have a rest period on the ground of not less than 24 consecutive hours.

48.5.2.3 He may fly, and an operator may permit him to fly, as a flight crew member tours of duty of more than 12 hours but less than 24 hours without an intervening rest period on the ground where adequate rest facilities are provided in the aeroplane. The total hours flown in any such series shall not exceed 60 hours without his having a rest period on the ground of not less than 24 consecutive hours.

48.5.2.4 In calculating hours for the purpose of paragraph 48.5.2.3 all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

48.5.2.5 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 350 hours in any 90 consecutive days.

48.5.2.6 He shall not fly, and an operator shall not roster him to fly, as a flight crew member in excess of 1,000 hours in any 365 consecutive days.



BELGIUMApplicability of Regulations

Regulations issued by the State apply to pilots only. Additional regulations developed by operators and flight personnel cover all crew members.

RegulationsFlight Time

For the purposes of this order the total flight time is the time during which the pilot in question forms part of a crew, irrespective of the type of flight or the duties performed aboard the aircraft.

Total flight time is set at 1,200 hours per year, provided that it does not exceed the following maxima for any period of three consecutive months:

a) Flights in Europe or inter-continental flights where the greater part of the route followed lies north of the 40th parallel N:

390 hours during the period from 1 May to 30 September incl. (in principle, 130 hours per month).

270 hours during the period from 1 October to 30 April incl. (in principle, 90 hours per month).

b) Flights where the greater part of the route followed lies south of the 40th parallel N:

390 hours per year (in principle, 130 hours per month).

N.B. A margin of 5% of the maximum flight time is authorized to allow a pilot to return to his base from abroad.

With particular reference to SABENA - the airline which employs almost all the flight personnel in Belgium - it should be noted further that:

a) Their contracts stipulate additional limitations which are set forth in the collective agreement between the company and the flight personnel's representative bodies. They apply to both the flight crew members and the non-technical flight personnel, and vary according to the network involved (Europe and long-distance). In addition to the actual flight time certain other periods are considered as forming part of the total time:

- the periods which precede and follow departures and arrivals;

- the period between the scheduled arrival and departure of two consecutive flights (terminal and intermediate stops).

b) In regard to leave and rest periods, which also vary according to the network to which personnel are assigned, special provisions are made in the collective agreement.

c) Annual vacations for flight crew members and for non-technical flight personnel are fixed at 30 days, and this period cannot be split except into two fifteen-day periods.

d) Very strict medical supervision is exercised so as to ensure that flight personnel are at all times in the physical condition required for their flying duties. In addition they must undergo complete and rigid medical examinations every six months. These examinations are conducted under the supervision of government medical offices.

BELGIAN CONGO

Applicability of Regulations - Regulations which are issued by the State apply to all flight crew members and all types of commercial air operations. Each category of flight crew member is treated separately.

RegulationsArticle 170

Every operator of an air transport service shall fix flying time limitations for each of the flight crew members, in such a way as to ensure that fatigue resulting from a flight or series of flights, or accumulated over a certain period, does not endanger the safety of flights.

Article 171

These limits shall be subject to the approval of the Governor General or his representative, and shall in no case be higher than:

## 1) Pilots:

1,200 hours for a period of 12 months, with a maximum of 100 hours per month. However, this monthly maximum may be raised, on an exceptional basis, to 120 hours, subject to the agreement of the medical authority as described in Article 168 of the present regulations;

## 2) Flight navigators, radio operators and mechanics:

1,400 hours for a period of 12 months, with a maximum of 120 hours per month. However, this monthly maximum may be raised, on an exceptional basis, to 140 hours, subject to the agreement of the medical authority as described in Article 168 of the present regulations.

BRAZILApplicability of Regulations

Regulations which are issued by the State cover all crew members and apply to scheduled and non-scheduled operations. Each category of crew member is treated separately.

Regulations

Article 1 - The flight time limitations laid down in Tables 1 and 2 attached hereto shall apply to crew members of airlines.

Article 2 - Any airline operator who exceeds the flight time limitations laid down in the above-mentioned tables shall be liable to a fine of from 5,000 to 20,000 cruzeiros (which shall be doubled if the offense is repeated), even if he does so with the consent of the crew members concerned, in which case the crew members themselves shall also be liable to the minimum fine specified above.

The fines provided in this Article shall be imposed separately, in each case, by the Director of Civil Aviation, according to the seriousness of the offense.

Article 3 - An airline may request authorization from the Minister to make minor alterations in the limits laid down, whenever, in particular cases, in connection with the operation of international services, duly proven difficulties are experienced in establishing duty rosters and rest periods for crew members.

TABLE No. 1

Flight time limitations for aircraft without relief crew

CREW	Monthly Maximum	Quarterly Maximum	Annual Maximum	Maximum per 24-hour period	Maximum of exclusively night flying	Uninterrupted rest period
Pilot-in-command	110 hrs.	300 hrs.	1,100 hrs.	12 hours	70 hours per week	24 hours each week
Co-pilot, Radio Operator and Steward	115 hrs.	330 hrs.	1,200 hrs.			

Note: Night flying is considered to be that performed between sunset and sunrise. In exceptional cases, crew members may be allowed to exceed the limit of 12 hours flying per 24-hour period, but only if the excess does not exceed 2 hours and is performed aboard the same aircraft for the purpose of completing a flight.

**TABLE No. 2****Flight time limitations for aircraft with relief crew**

	Maximum per 24-hour period	Monthly maximum	Quarterly maximum	Annual maximum	UNINTERRUPTED REST PERIOD		
					24 hours	30 hours	At least twice the number of hours flown
All crew members	20 hrs.	120 hrs.	350 hrs.	1,200 hrs.	After more than 15 hours and less than 18 hours of flying	After more than 18 hours of flying	After return to base from a trip the total duration of which exceeded 36 hrs, whether or not intermediate rest periods were provided.

**Note:** Night flying is considered to be that performed between sunset and sunrise. When a crew operates alternately with and without relief, a limit of 320 hours per quarter and 1,150 hours per annum will be allowed.

In exceptional cases, crew members may be allowed to exceed the limit of 20 hours per 24-hour period, but only if the excess does not exceed 4 hours and is performed aboard the same aircraft for the purpose of completing a flight.

BURMAApplicability of Regulations

Regulations which are issued by the State apply to pilots only and to all commercial operations.

Regulations

A certificate of medical fitness shall be required before the Captain of an aircraft is allowed to fly in excess of 125 hours within a period of one month.

CANADAApplicability of Regulations

Regulations which must be developed by an operator and submitted to the State for approval must cover all flight crew members and apply to scheduled and non-scheduled operations.

Regulations

No person shall operate in Canada any commercial air service unless he holds a valid and subsisting certificate issued by the Minister certifying that the holder thereof is adequately equipped and able to conduct a safe operation as an air carrier over a prescribed route or in a prescribed area.

These certificates issued by the Minister, known as operating certificates, require flight time limitations to be established by the operator for approval by the Minister. Paragraph 3.2.6-4 of Information Circulars 0/43/51 Scheduled and 0/2/52 Non-Scheduled air services states:

An operator shall establish limitations on the flight crew members. These limitations shall be such as to ensure that fatigue, either occurring in a flight or successive flights or accumulating over a period of time, does not endanger the safety of a flight. The limitations shall be approved by the Minister.

CEYLONApplicability of Regulations

Regulations which are issued by the State apply to pilots only and to every type of commercial operation. Various categories of pilot are treated separately.

Regulations**A - Airline Transport Pilot**

I. An Airline Transport Pilot who is acting as a pilot of an aircraft which carries one or two pilots, but which does not carry a Flight Radio Operator is subject to the following limitations:

a) Other than with the permission in writing of the Director, he must not fly as a member of the operating crew of a public transport aeroplane in excess of eight hours in any 24 consecutive hours, unless he has a rest period at or before the termination of such 8 hours of flying. Such rest period must be not less than 8 hours and during such rest period he must be free from all duties associated with his employment.

b) When he has, in accordance with the provisions of a) above, flown as a member of the operating crew of a public transport aircraft in excess of 8 hours in any 24 consecutive hours, he must have a rest period of at least 24 hours, and during such rest period he must be free from all duties associated with his employment.

c) In calculating hours for the purpose of the limitations prescribed in a) and b) above, all waiting time in excess of three hours in any one tour of duty will be reckoned as flight time.

d) He must not fly as a member of the operating crew of a public transport aircraft in excess of 30 hours in any 7 consecutive days. Relief from all duties for not less than 24 consecutive hours must be taken by such pilot once during any 7 consecutive days.

e) He must not fly as a member of the operating crew of a public transport aircraft in excess of 100 hours in any 30 consecutive days.

f) He must not fly as a member of the operating crew of a public transport aircraft in excess of 1,000 hours in any 12 consecutive months.

g) While employed in regular public transport service he must not engage in any other form of flying when such flying, in addition to that in regular public transport service, will exceed any flight time limitation specified herein.

II. An Airline Transport Pilot who is acting as pilot of an aircraft which carries two pilots and a Flight Radio Operator is subject to the following limitations:

a) Other than with the written permission of the Director he must not fly as a member of the operating crew of a public transport aircraft in excess of 12 hours in any 24 consecutive hours, unless he has a rest period at or before the termination of such 12 hours of flying. Such rest period must not be less than 8 hours and during such rest period he must be free from all duties associated with his employment.

b) When in accordance with the provisions of II a) he has flown as a member of the operating crew of a public transport aircraft for 20 hours or more in any 48 consecutive hours, or 24 hours or more in any 72 consecutive hours, he must have a rest period of not less than 24 hours before being available for further duty. In any case a rest period of not less than 24 consecutive hours must be taken by such pilot once during any 7 consecutive days. During such rest periods he shall be free from all duties associated with his employment.

c) In calculating hours for the purpose of the limitations prescribed in II a) and b), all waiting time in excess of 3 hours in any one tour of duty will be reckoned as flight time.

d) He shall not fly as a member of the operating crew of a public transport aircraft in excess of 120 hours in any 30 consecutive days or in excess of 300 hours in any 90 consecutive days.

e) He shall not fly as a member of the operating crew of a public transport aircraft in excess of 1,000 hours during any 12 consecutive months.

f) While employed in regular public transport service, he must not engage in any other form of flying when such flying, in addition to that in regular public transport service, will exceed any flight time limitation specified herein.

III. An Airline Transport Pilot who is acting as a pilot of an aircraft which carries three or more pilots is subject to the following limitations:

a) He must not fly, as a member of the operating crew of a public transport aircraft, in excess of 30 hours without an intervening rest period on the ground; and rest facilities must be provided in the aircraft. Periods of active duty must not exceed 4 hours and the intervening rest periods must not be less than 2 hours.

b) When he has completed a tour of duty as outlined in III a) above, he must have a rest period on the ground of not less than 24 hours. During such rest period he must be free from all duties associated with his employment.

c) He may fly a series of flights, as a member of the operating crew of a public transport aircraft, of more than 12 hours but less than 24 hours, with an intervening rest period on the ground of not less than 12 hours after each such flight, but rest facilities must be provided in the aircraft. Periods of active duty must not exceed 4 hours and the intervening rest periods must not be less than 2 hours. The total hours flown in any such series of flights must not exceed 60 hours without the pilot having a rest period on the ground of not less than 24 hours. During such rest period he must be free from all duties associated with his employment.

d) Upon return to base after a series of such flights he must have a rest period of not less than twice the total number of hours flown during such series. During such rest period he must be free from all duties associated with his employment.

e) In calculating hours for the purpose of the limitations prescribed in III a), b), c) and d) all waiting time in excess of 3 hours in any one tour of duty will be reckoned as flight time.

f) He must not fly as a member of the operating crew of an aircraft in excess of 350 hours in any 90 consecutive days.

g) He must not fly as a member of the operating crew of a public transport aircraft in excess of 1,000 hours in any 12 consecutive months.

h) While employed in regular public transport service, he must not engage in any other form of flying when such flying in addition to that in regular public transport service will exceed any flight time limitation specified herein.

**B - Commercial and Senior Commercial Pilot**

**I.** The following flight time limitations are prescribed in respect of all Commercial and Senior Commercial Pilots engaged in flying for hire or reward:

a) Other than with the written permission of the Director, no Commercial or Senior Commercial Pilot may fly as a member of the operating crew of an aircraft in excess of 8 hours in any 24 consecutive hours unless he has a rest period at or before the termination of such eight hours of flying. Such rest period must not be less than 8 hours and during such rest period he must be free of all duties associated with his employment.

b) When a Commercial or Senior Commercial Pilot has flown as a member of the operating crew of an aircraft in excess of 8 hours but not exceeding 10 hours, in any 24 consecutive hours, he must have a rest period of at least 24 hours and must be free of all duties associated with his employment.

c) In calculating hours for the purpose of the limitations prescribed in the two subparagraphs immediately preceding, all waiting time in excess of 3 hours in any one tour of duty will be reckoned as flight time.

d) No Commercial or Senior Commercial Pilot should fly as a member of the operating crew of an aircraft in excess of 30 hours in any 7 consecutive days. Relief from all duties for not less than 24 consecutive hours must be taken at least once during any 7 consecutive days by any pilot who has so flown.

e) No Commercial or Senior Commercial Pilot should fly as a member of the operating crew of an aircraft in excess of 100 hours in any 30 consecutive days.

f) No Commercial or Senior Commercial Pilot should fly as a member of the operating crew of an aircraft in excess of 1,000 hours during any 12 consecutive months.

g) No Commercial or Senior Commercial Pilot, while engaged in flying for hire or reward should engage in any other flying when such flying, in addition to that for hire or reward, will exceed any flight time limitations specified herein.



DENMARKApplicability of Regulations

Regulations, which must be developed by operators and submitted to the State for approval, cover all flight crew members on scheduled and non-scheduled operations.

Regulations

Any commercial operator is under the obligation to draw up regulations for flight crew duty hours which regulations are submitted to the Civil Aviation Administration for approval.

EGYPTApplicability of Regulations

Regulations issued by the State apply to pilots only and to scheduled and non-scheduled operations.

Regulations

No pilot-in-command nor a co-pilot on a public transport aircraft is allowed to fly more than:

- 1) 125 hours in 30 consecutive days
- 2) 1,000 hours in one year.

FINLANDApplicability of Regulations

Regulations which are issued by the State apply to pilots only and to scheduled and non-scheduled operations which are treated separately.

Regulations

The following maximum flight times have been confirmed by this Office for the Finnish operators:

1. At the most 1,000 hours per calendar year
2. At the most 120 hours per calendar month
3. Flight time in a day and night shall not exceed:

- 3.1 in scheduled operations

8 hours with the reservation that, in urgent cases and according to his own deliberation, a pilot may fly even more than that provided that this Office is informed of the matter and possibility to be off all duty at least 8 hours after the concluded flight is arranged for the pilot.

- 3.2 in non-scheduled operations

12 hours provided that the total flight time in two successive days and nights does not exceed 16 hours.

FRANCEApplicability of Regulations

The regulations are issued by the State and apply to all crew members on all types of commercial air operations. Flight crew members and other crew members are treated separately as are scheduled operations and all other types of commercial operations.

RegulationsAPPLICATIONArticle 1

The provisions of the present Decree shall apply to flight crew members, including other crew members, of air transport and air work enterprises.

DEFINITIONSArticle 2

For the purposes of the present Decree:

"Flight time" shall be deemed to mean the time from the moment the aircraft first moves under its own power for the purpose of proceeding to the take-off area until the moment it comes to rest at the end of the flight.

"Long haul flight" shall be deemed to mean a journey by air which takes a crew member of an aircraft more than three thousand nautical miles away from his base station, or the predetermined itinerary of which comprises a leg of more than one thousand two hundred nautical miles between two consecutive stops.

DISTRIBUTION OF FLYING HOURSArticle 3

1. In present operating conditions of the enterprises mentioned in Article 1 of the present Decree, it is considered that the effective working hours prescribed by the Law of 21 June 1936 corresponds to an average monthly flight time of 85 hours distributed over the year.

2. Taking into account the annual vacation time of flight crews and except as otherwise provided in the circumstances set out in Article 7 hereunder, flight time limitations shall be fixed at 235 hours per quarter, 510 hours per half-year and 935 hours per year.

REST PERIODSArticle 4

1. Flight crews assigned to long haul flights shall be entitled to a rest period at their base station of at least four consecutive days per month.

2. Flight crews assigned to short and medium haul flights shall be entitled to at least one rest period per week at their base station of not less than 36 consecutive hours:

LIMITATION OF CONSECUTIVE HOURS OF FLIGHT TIME  
AND OF FLIGHT TIME ON CONSECUTIVE FLIGHTS

A. Flight Crew Members

Article 5

1. Flight crew members with no replacement or assistant -

In each twenty-four-hour period, consecutive flight time shall not exceed eight hours in the case of pilots and ten hours in the case of other crew members. These figures may be increased by 50 per cent if the flight is broken by one or more stops.

2. Flight crew members with replacement or assistant, or acting as replacement or assistant to another crew member - Flight times, with or without stop-overs, shall not exceed:

- in the case of pilots:

- seventeen consecutive hours, if adequate rest facilities are not available to the crew on board;

- twenty-two consecutive hours, if adequate rest facilities are available to the crew on board;

- in the case of other crew members:

- twenty and twenty-five hours respectively.

3. At the end of the flight times prescribed in paragraphs 1 and 2 above, flight crews shall be entitled to a rest period at least equal to twice the number of flying hours accomplished since the preceding rest period, and in no case less than eight hours.

If, owing to operational requirements, flight crew members are required to fly again without the benefit of a rest period at least equal to twice the number of hours flown since the preceding rest period, the duration of the rest period following the second flight period shall be increased by the number of hours of rest still due from the rest period following the first flight period.

However, flight crew members shall be permitted to fly again only if the duration of the rest period following the first flight period is not less than the duration of flights accomplished during this first flight period and, in any case, not less than eight hours.

4. Where due justification exists, the Director of transport man-power may, by agreement with the General Secretariat for Civil and Commercial Aviation, and after consulting the union representatives or, in their absence, the persons involved, authorize modifications to the provisions of subparagraphs A-2 and A-3 above.

5. Time spent in flight as a passenger shall not be included in the rest periods when the journey is imposed by official duty requirements.

When a flight crew member makes a long haul flight as a passenger on official duty, he may not be assigned to further duty on arrival until the expiry of a rest period, at the point of disembarkation, at least equal to the duration of the flight carried out as a passenger on official duty.

B. Other Crew Members

The limitations applicable to other crew members shall be those provided in subparagraphs A-2, A-3, A-4 and A-5 above.

6. Notwithstanding the provisions of paragraphs A-1, A-2, A-3, A-4, A-5 and B above, at the request of a professional association of employers or employees Departmental Orders may be issued by the competent minister, after consultation with interested associations and taking into account the agreements, if any, in force between them, authorizing a system of distribution of the duration of flight hours and rest hours over a different period of time.

### CONTROL MEASURES

#### A. Scheduled Services

##### Article 6

1. Duty schedules shall be established for each route, groups of routes or for sections of routes or groups of sections of routes, as appropriate.

2. The duty schedule shall indicate, in GMT, the time at which each flight period begins and ends. The total time comprised within these periods shall not exceed the limits prescribed by the present Decree.

3. Appropriate corrections shall be made to established duty scheduled before any changes in flight time provisions take effect.

4. A copy of the duty schedule and of any corrections thereto shall be sent in advance to the official responsible for the regulations of working conditions.

#### B. All Services

5. Particulars of flight time shall be entered in an individual log book held by each crew member. Each crew member shall carry his individual duty log book when on duty and shall hand it to the pilot-in-command on each trip.

The individual duty log book shall be in the form as specified by an Order, issued by the Minister of Public Works, Transport and Tourism and the Minister of Labour and Social Security.

6. The individual duty log shall at all times be open to inspection by the authorities responsible for the regulation of working conditions.

7. Other control methods, completing or replacing the methods prescribed above, may be authorized by an Order issued by the Minister of Public Works, Transport and Tourism and the Minister of Labour and Social Security, after consultation of the professional associations of employers and employees.

### EXCEPTIONS

#### Article 7

1. Derogations to the limitations prescribed in the present Decree shall be authorized in the following circumstances:

1) Urgent flights, which must be performed immediately:

a) to prevent impending accidents, organize rescue operations or take remedial action in regard to accidents to either aircraft or facilities;

b) to ensure emergency repairs to aircraft;

2) To ensure completion of a flight delayed in relation to the predetermined schedule, by unforeseen circumstances;

3) Flights carried out in the interests of security or national defense, or of a government agency, by a Government Order showing the need for the derogation. The limits shall be determined by the Minister of Public Works, Transport and Tourism;

4) Urgent work in cases of work overload.

Such derogations shall be applied in the conditions prescribed in, and subject to, legislation in force.

2. Flight time performed pursuant to derogations under items 1), 2) and 4) of paragraph 1 above shall not have the effect of raising the total duration of flying hours to more than the following maxima:

- in any one month: 130 hours;
- during any two consecutive months: 230 hours;
- during any three consecutive months: 330 hours;
- per annum: 1,050 hours.

3. Flying hours, totalled per quarter, shall be considered, from the 256th upwards, as overtime, except those performed under item 1) a) of paragraph 1 above, and shall involve entitlement to an increase of 25 per cent in remuneration provisions, excluding reimbursement of expenses.

Aside from quarterly payment of overtime, flight time performed during the four quarters shall be totalled at the end of each year. If the total number of hours performed is greater than 935, hours performed in excess of this figure and not remunerated on a quarterly basis shall be considered as overtime and remunerated according to the conditions prescribed in the above subparagraph.

4. For the purpose of paragraph 3 above, the term "quarter" shall be deemed to mean the calendar periods beginning respectively on 1 January, 1 April, 1 July and 1 October.

#### Article 8

The Minister of Public Works, Transport and Tourism and the Minister of Labour and Social Security shall be responsible in their respective fields for the execution of the present Decree, which shall be published in the Journal officiel de la République française.

GREECEApplicability of Regulations

Regulations which are issued by the State apply to all crew members and to all types of commercial operations.

Regulations

1. The maximum limits of flight time of any rating qualified or not crew members are:
  - a) Weekly, up to 32 hours
  - b) Monthly, up to 120 hours
  - c) Quarterly, (continuously), up to 300 hours
  - d) Yearly, up to 1,000 hours.

On estimating the above limits it has been taken into consideration a flight time accomplished by airmen on Airwork and Public Transports aircraft.

2. The National Airlines are compelled to grant the following rest period to any rating, qualified or not crew members, operating on their aircraft.

- a) 24 hours continuous rest, weekly
- b) 15 days rest leave, half yearly.

HONDURASApplicability of Regulations

Regulations issued by the State apply to all flight crew members and all types of commercial operations.

Regulations

No flight crew member shall fly more than 75 hours per month. Any time in excess of this shall be compensated at double the usual rate for workdays and triple for holidays. In no case shall the flight time exceed 80 hours per month . . . . ."

In addition this Directorate has established a regulation which limits the daily maximum to eight hours.

IRELANDApplicability of Regulations

Regulations must be developed by an operator and submitted to the State for approval. Such regulations apply to all flight crew members and to all types of commercial operations.

Regulations

There is, in this country, an officially prescribed limit of 125 hours total flying time as member of an operating air crew within any period of 30 consecutive days since the last medical examination; and an air crew member who reaches that total must cease to act in that capacity until he has been medically examined and pronounced fit.

In the case of Aer Lingus Teoranta, who employ nearly all the professional flight crew members in this country, a flight crew member employed by that company does not normally exceed a total of 100 hours flying time in a period of 30 consecutive days. The flight crew members are rostered on a basis designed to ensure as far as possible that fatigue will not occur.

ISRAELApplicability of Regulations

Regulations are issued both by the State and by operators following approval of the State. They cover all flight crew members and all types of commercial operations; however, various categories of flight crew members and types of operations are treated differently.

Regulations

In our Aviation Law there is no proviso for flying time limits for air crews except a monthly limit of 100 flying hours which, if surpassed, requires a new medical examination.

If the Regulations (issued by the Civil Aviation Department) we limit the time of the pilot-in-command to 16 hours in one day flying if he is assisted by a second pilot (flying with a co-pilot) and to 10 hours if unassisted. Our companies maintain a limit for any air crew member of not more than 12 flying hours in one day on scheduled flights and not more than 85 hours per month.

In view of the above, the answer to your suggested headings would be as follows:

AEH: Pilots are limited to 100 flying hours per month.

BDF: Flight crew members are limited to 85 flying hours per month and to 12 hours per day.

BEG: Pilots are limited to 85 flying hours per month and to 13 hours per day.

BDG: Flight crew members are limited to 85 flying hours per month while it is in the crew captain's discretion to fix the daily flight limit.



JAPANApplication of Regulations

Regulations must be developed by an operator and submitted to the State for approval. These regulations apply to all flight crew members and to all types of commercial operations; however, national and international operations are treated separately.

Regulations

## i) National air services:

The crew assignment shall be prepared in such a way that the flight time does not exceed the limits of 100 hours a calendar month and 1,000 hours a calendar year.

## ii) International air services:

The crew assignment shall be prepared in such a way that the flight time does not exceed the limits of 120 hours a calendar month, 300 hours per three calendar months, and 1,000 hours a calendar year.

## iii) National and international air services combined:

The provisions for the national air service are applied.

LEBANONApplicability of Regulations

Regulations issued by the State apply to all crew members and to all types of commercial operations.

RegulationsArticle 1

A flight crew member shall be deemed to be any person authorized by an operator to perform duties on board an aircraft during flight. By flight time is meant the total time from the moment the aircraft moves until the moment it comes to rest.

Article 2

Except in the special cases defined in Article 4 of the present Decree, the flight time of all persons charged with duties on board an aircraft shall be limited as follows:

- 125 hours per month
- 345 hours in any three consecutive months
- 650 hours in any six consecutive months
- 1,200 hours per annum.

Article 3

Any person charged with duties on board an aircraft shall be entitled after a flight to a period of rest equal to double the flight time logged since the last previous rest period.

Where necessary, however, or where a flight crew member is required to make a second flight without having enjoyed the full rest period, he shall be entitled to add the rest period remaining from his first flight to the rest period which follows this second flight.

In all cases the rest period shall never be less than the flight time which preceded it, and in any event not less than 8 hours.

Time spent flying as a passenger on company duty shall not be considered as rest time.

Article 4

The provisions of Article 3 shall not apply in the following cases:

- a) flights which are essential for general safety reasons or for search and rescue operations;
- b) flights which are essential for testing or repair purposes in the event of malfunctioning of an aircraft or its equipment or for continuing an air journey which has been interrupted by unforeseen circumstances;
- c) work peaks, provided authorization is obtained from the Directorate of Civil Aviation.

In the cases referred to above, flight time shall not exceed the following limits:

- 140 hours per month
- 260 hours in any two consecutive months
- 380 hours in any three consecutive months.

#### Article 5

All operators are required:

- 1) to establish a register in which shall be entered the flight time of all flight crew members and which must be presented on request from any responsible official;
- 2) to establish an individual duty card for all flight crew members.

All flight crew members are required to hold the flight time log issued to them by the Directorate of Civil Aviation and to enter their flight time therein. This log must be presented on request from responsible officials.

#### Article 6

Any flight crew member who has flown for 125 hours in any given month shall be required to submit to a medical examination before resuming duty.

#### Article 7

The licence issued to any flight crew member shall be withdrawn immediately in the event of non-compliance with the provisions of the present Decree, particularly if the number of hours flown exceeds the limit authorized by this Decree.

The licence of any crew member may also be withdrawn if the operator has failed to establish a register showing the hours flown by crew members of his aircraft or if he has not provided them with individual duty cards.

MEXICOApplicability of Regulations

Regulations issued by State, apply to all flight crew members.

Regulations

"When the members of a flight crew have flown more than 8 hours 30 minutes during the last twenty-four hours, they must receive 24 hours of rest before being assigned to other flight duties.

The members of a flight crew shall not fly more than 30 hours during a period of 7 consecutive days, and at least once during this period they must be relieved of all duties for 24 consecutive hours.

The members of a flight crew may not fly more than 90 hours per month, nor more than 1,000 hours per year."

NETHERLANDSApplicability of Regulations

Regulations must be developed by an operator and submitted to the State for approval. These apply to all crew members and to scheduled and non-scheduled operations except that regulations applying to crew members other than flight crew do not require State approval.

Regulations

A. No detailed rules are given with respect to the work and rest periods for the cockpit crews. The operator is, however, required to draw up regulations concerning times of work and rest for cockpit crews, and submit them for government approval.

These regulations, on being submitted for approval, will be judged by factors, which might influence fatigue, such as: average weather conditions, day and night flights, time of departure, climate, accommodation on board and at the stops, beaconing along the route, automatic pilot, experience of personnel, leave-scheme, assignment schedule and crew - turn around schedule.

B. The regulations concerning times of work and rest applied by the national air carrier, which, besides the factors mentioned under A, also include social factors, have been provisionally approved pending definite regulations. It is expected that the definite regulations will become effective as from 15 April next. These regulations will contain the following with respect to the flying hours of the cockpit-crew:

assignments as crew members will be such that the flying hours will not exceed

380 hours in 3 months  
710 hours in 6 months  
1,030 hours in 9 months  
1,260 hours in 12 months.

NEW ZEALANDApplicability of Regulations

Regulations issued by the State apply to all flight crew members and to scheduled and non-scheduled operations. Various categories of flight crew members are treated separately.

RegulationsPILOTS

3. 1) A pilot of an aircraft which carries one or two pilots but which does not carry any other flight crew member shall be subject to the following flight time limitations:

a) He shall not fly as a flight crew member in excess of 8 hours in any one tour of duty.

b) He shall not fly as a flight crew member in excess of 8 hours in any consecutive twenty-four hours unless he is enabled to have the following rest periods:

i) At or before the completion of the first 8 hours of flight time, not less than ten consecutive hours.

ii) At the conclusion of his flight time, at least twelve consecutive hours including the hours between 10 p.m. and 6 a.m. local time, or, alternatively, at least twenty-four consecutive hours.

c) He shall not fly as a flight crew member in excess of 35 hours in any seven consecutive days.

d) He shall not fly as a flight crew member in excess of 100 hours in any thirty consecutive days.

e) He shall not fly as a flight crew member in excess of 1,000 hours in any twelve consecutive months:

Provided that:

i) In calculating flight time for the purpose of the limitations prescribed by subparagraphs a) and b) above all waiting time in excess of four hours in any one tour of duty shall be reckoned as flight time.

ii) In respect of the limitations specified above, the licence holder shall be given a rest period of not less than twenty-four consecutive hours at least once in any seven consecutive days.

2) A pilot of an aircraft which carries two pilots and a third flight crew member shall be subject to the following limitations:

a) He shall not fly as a flight crew member in excess of 12 hours in any twenty-four consecutive hours without having a rest period of not less than ten consecutive hours at or before the completion of the first 12 hours of flight time:

Provided that:

i) When he has flown as a flight crew member in accordance with the provisions of this clause for 20 hours or more in any forty-eight consecutive hours or 24 hours or more in any seventy-two consecutive hours he shall have a rest period of not less than twenty-four consecutive hours.

ii) In calculating flight time for the purpose of the limitations specified in this clause, all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

b) He shall not fly as a flight crew member in excess of 120 hours in any thirty consecutive days, or in excess of 300 hours in any ninety consecutive days.

c) He shall not fly as a flight crew member in excess of 1,000 hours in any twelve consecutive months:

Provided that in respect of the limitations specified in this subparagraph, the licence holder shall be given a rest period of not less than twenty-four consecutive hours at least once in any seven consecutive days.

3) A pilot of an aircraft which carries three or more pilots shall be subject to the following limitations:

a) He may fly, as a flight crew member, a tour of duty not exceeding 30 hours without intervening rest period on the ground:

Provided that:

i) Adequate rest facilities are provided on the aircraft;

ii) Periods of active duty do not exceed 4 hours and intervening periods free of duty are not less than two hours; and

iii) On completion of the tour of duty he is granted a rest period on the ground of not less than twenty-four consecutive hours.

b) He may fly, as a flight crew member, tours of duty of more than 12 hours but not exceeding 24 hours:

Provided that:

i) Adequate rest facilities are provided on the aircraft.

ii) There is an intervening rest period on the ground of not less than twelve consecutive hours after each tour of duty.

iii) Periods of active duty do not exceed 4 hours and intervening periods free of active duty are not less than two hours.

iv) The total hours flown in any such tours of duty do not exceed 60 hours without the pilot having a rest period on the ground of not less than twenty-four consecutive hours.

v) On return to his home base after any such tour of duty he is granted a rest period on the ground of not less than twice the total number of hours flown during the tours concerned.

In calculating hours for the purpose of the limitation specified in this clause waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

c) He shall not fly as a flight crew member in excess of 350 hours in any ninety consecutive days.

d) He shall not fly as a flight crew member in excess of 1,000 hours in any twelve consecutive months.

NAVIGATORS

4. 1) A navigator of an aircraft which carries only one flight navigator shall be subject to the following limitations:

a) Except with the written permission of the Director, he shall not fly as a flight crew member in excess of 12 hours in any twenty-four consecutive hours without having a rest period of not less than ten consecutive hours at or before the completion of the first 12 hours of flight time:

Provided that:

i) When in accordance with this clause he has flown as a flight crew member for 20 hours or more in any forty-eight consecutive hours or 24 hours or more in any seventy-two consecutive hours, he shall have a rest period of not less than twenty-four consecutive hours.

ii) In calculating flight time for the purpose of this clause all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

b) He shall not fly as a flight crew member in excess of 120 hours in any thirty consecutive days, or in excess of 300 hours in any ninety consecutive days.

c) He shall not fly as a flight crew member in excess of 1,000 hours in any twelve consecutive months.

In respect of the limitations specified in this paragraph, the licence holder shall be given a rest period of not less than twenty-four consecutive hours at least once in any seven consecutive days.

2) A navigator of an aircraft which carries two or more flight navigators shall be subject to the following limitations:

a) He may fly, as a flight crew member, a tour of duty not exceeding 30 hours without an intervening rest period on the ground:

Provided that:

i) Adequate rest facilities are provided on the aircraft.

ii) Periods of active duty do not exceed 4 hours and intervening periods free of duty are not less than two hours.

iii) On completion of the tour of duty he is granted a rest period on the ground of not less than twenty-four consecutive hours.

b) He may fly, as a flight crew member, a series of flights of more than 12 hours but not exceeding 24 hours without an intervening rest period on the ground:

Provided that:

i) Adequate rest facilities are provided on the aircraft.

ii) Periods of active duty do not exceed 4 hours and intervening periods free from duty are not less than two hours.

iii) Upon return to his home base after a series of any such flights he shall have a rest period of not less than twice the total number of hours flown during the series of flights concerned.

In calculating the hours for the purpose of this clause, all waiting time in excess of three hours in any one tour of duty shall be reckoned as flight time.

c) He shall not fly as a flight crew member in excess of 350 hours in any ninety consecutive days.

d) He shall not fly as a flight crew member in excess of 1,000 hours in any twelve consecutive months.

#### RADIO OPERATORS

5. 1) A radio operator of an aircraft which carries only one flight radio operator shall be subject to the same limitations as specified in paragraph 3 1) hereof for flight navigators.

2) A radio operator of an aircraft which carries two or more flight radio operators shall be subject to the same limitations as are specified in paragraph 3 2) hereof for flight navigators.

#### FLIGHT ENGINEERS

6. 1) A flight engineer of an aircraft which carries only one flight engineer shall be subject to the same limitations as specified in paragraph 3 1) hereof for flight navigators.

2) A flight engineer of an aircraft which carries two or more flight engineers shall be subject to the same limitations as are specified in paragraph 3 2) hereof for flight navigators.

#### DEFINITIONS

7. For the purpose of paragraphs 3 to 6 inclusive the expression:

"Adequate rest facilities" means rest facilities considered by the Director to provide suitable rest for resting crew members, having regard to the service concerned.

"Waiting time" means all time spent during a tour of duty by a flight crew member, on duty of any nature associated with his employment prior to departure on a flight, on the ground at intermediate stopping places and after arrival at the destination aerodrome of that tour of duty.

"Tour of duty" means the period between the time a crew member commences pre-flight duties and the time he is finally relieved of all duties associated with his employment.

"Rest period" means a period of time during which a flight crew member is relieved of all duties associated with his employment.



PAKISTANApplicability of Regulations

Regulations issued by the State apply to all crew members and to all types of commercial operations. Various categories of crew members are treated separately.

RegulationsPilots

1. No pilot shall fly as an operating crew member for more than 1,000 hours and 300 hours in periods of 12 and 3 consecutive calendar months respectively, or shall exceed 120 hours in one period of 30 consecutive days.

2. Aeroplanes having a crew of one or two pilots

A pilot may be scheduled to fly eight hours, or less, during any twenty-four consecutive hours without a rest period during such eight hours. If a pilot is scheduled to fly in excess of eight hours during any twenty-four consecutive hours, he shall be given an intervening rest period at, or before, the termination of eight scheduled hours of flight duty. Such rest period must equal at least twice the number of hours flown since the last preceding rest period and in no case will such rest period be less than eight hours. During such rest period the pilot must be relieved of all duty with the operator.

When a pilot has flown in excess of eight hours during any twenty-four consecutive hours, he must receive at least eighteen hours of rest before being assigned any duty with the Operator. A pilot shall not fly in excess of thirty-two hours during any seven consecutive days. Relief from all duty for not less than twenty-four consecutive hours must be provided for and given to a pilot at least once during any seven consecutive days.

3. Aeroplanes having two pilots and one additional flight crew member (radio officer, flight engineer or navigator)

A pilot may not be scheduled to fly a total of more than twelve hours during any twenty-four consecutive hours. When a pilot has flown twenty hours or more during any forty-eight consecutive hours, or twenty-four hours or more during any seventy-two consecutive hours, he must receive at least eighteen hours of rest before being assigned to any duty with the Operator. In any case, each pilot shall be relieved from all duty for not less than twenty-four consecutive hours during any seven consecutive days.

A pilot shall not fly as a member of the flight crew more than 120 hours in any one month.

4. Aeroplanes having three or more pilots and one or more additional flight crew member(s)

Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the pilot is away from his base. Adequate sleeping quarters on the aeroplane must be provided in all cases where a pilot is scheduled to fly more than twelve hours during any twenty-four consecutive hours.

A pilot, upon return to his base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours flown since the last rest period, at his base and, during such period, will not be required to perform any duty for the Operator.

Note: In the event of any delay on the ground before commencement of flight or en route, unless the crew have been provided with proper accommodation for rest, the period spent on ground shall be treated as on duty, and shall be added to the flying time for the purpose of paragraphs 2 and 3 above. Time spent by flight crews on any duty on ground before or at the end of a flight shall be treated likewise.

Flight crews travelling as passengers shall not be considered to have "earned rest" during the period of that flight until and unless they have actually availed of proper rest in suitable bunks during flight.

5. Pilots not regularly assigned

A pilot not regularly assigned as a flight crew member under the provision of paragraphs 3 and 4 shall not fly in excess of 120 hours in any one month.

6. Other Commercial Flying

A pilot shall not do other commercial flying while employed by an Operator, when the combined total flight time will exceed any flight time limitation specified herein.

Flight Crew Members other than Pilots

1. No operational crew member, e.g., Navigator, Flight Engineer, Radio Operator etc. (but excluding cabin attendants) shall fly for more than 1,000 hours and 300 hours in periods of 12 and 3 consecutive calendar months respectively, or shall exceed 125 hours in one period of 30 consecutive days. In case any of the above flight crew performs a total of 125 hours, he shall be required to undergo a medical examination before continuing flying. In this connection rule 42(IV) of the Aircraft Rules refers.

2. An operational flight crew member other than pilots, should not normally be scheduled to fly a total of more than 12 hours during any 24 consecutive hours. When a member of the flight crew has flown 24 hours or more during any 48 consecutive hours, he must receive at least 18 hours of rest before being assigned to any duty with the operator. In any case, each flight crew member shall be relieved from all duty for not less than 24 consecutive hours during any 7 consecutive days.

3. Where it is necessary owing to aircraft scheduling, for a flight crew member to exceed 12 hours consecutive duty, there must be on board the aircraft another crew member capable of relieving him and provision on board the aircraft must exist for providing adequate crew relaxation and rest. In such cases, flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the flight crew member is away from his base, and upon return to his base, he shall receive a rest period of not less than twice the total number of hours flown since the last rest period at his base and, during such period, shall not be required to perform any duty for the operator.

Note: In the event of any delay on the ground before commencement of flight or en-route, unless the crew have been provided with proper accommodation for rest, the period spent on the ground shall be treated as on duty and shall be added to the flying time for the purpose of paragraphs 2 and 3 above. Time spent by flight crews on any duty on the ground before or at the end of a flight shall be treated likewise.

4. Flight crews travelling as passengers shall not be considered to have earned rest during the period of that flight until and unless they have actually availed of proper rest in suitable bunks during flight.

PHILIPPINES REPUBLICApplicability of Regulations

Regulations issued by the State cover all flight crew members and apply to all types of commercial operations. Various categories of flight crew members are treated separately as are national and international operations.

RegulationsCHAPTER 12 - FLIGHT TIME LIMITATIONS12.1 Flight Time Limitations and Rest Periods for Pilots and Other Flight Crew Members

12.1.1 Rest periods of pilots of aeroplanes having a crew of one or two pilots. The following rules shall govern the rest periods of pilots of aeroplanes having a crew of one or two pilots:

1) No rest for flying 8 hours or less. The pilot may fly eight hours, or less, during any twenty-four consecutive hours without a rest period during such eight hours.

2) Rest twice the number of hours flown. If a pilot is scheduled to fly in excess of eight hours during any twenty-four consecutive hours, he shall be given an intervening rest period at, or before, the termination of eight scheduled hours of flight duty. Such rest period must equal at least twice the number of hours flown since the last preceding rest period and in no case will such rest period be less than eight hours. During such rest period the pilot must be relieved of all duty with the airline.

3) Rest for flying in excess of 8 hours during any twenty-four hours. When a pilot has flown in excess of eight hours during any twenty-four consecutive hours, he must receive at least eighteen hours of rest before being assigned any duty with the airline.

4) Rest for flying in excess of thirty-two hours during any seven consecutive days. A pilot shall not fly in excess of thirty-two hours during any seven consecutive days. Relief from all duties for not less than twenty-four consecutive hours must be given to a pilot at least once during any seven consecutive days.

12.1.1.1 Flight Time limitation in any one month. A pilot shall not fly as a member of the flight crew more than 100 hours during any one month.

12.1.1.2 Flight time limitation in any one calendar year. A pilot shall not fly as a member of the flight crew more than 1,000 hours in any one calendar year.

12.1.2 Rest period of pilots of aeroplanes having a crew of two pilots and one additional flight crew member. The following rules govern the rest periods of aeroplanes having a crew of two pilots and one additional flight crew member:

1) Pilot not to fly more than twelve hours. A pilot may not be scheduled to fly a total of more than twelve hours during any twenty-four consecutive hours.

2) Rest after twenty or twenty-four hours of continuous flying. When a pilot has flown twenty hours or more during any forty-eight consecutive hours, or twenty-four hours or more during any seventy-two consecutive hours, he must receive at least eighteen hours of rest before being assigned to any duty with the airline. In any case, each pilot shall be relieved from all duties for not less than twenty-four consecutive hours during any seven consecutive days.

12.1.2.1 Flight time limitation as member of flight crew. A pilot shall not fly as a member of the flight crew more than 120 hours in any one month, or 300 hours in any three calendar months.

12.1.2.2 Flight time limitation as member of flight crew. A pilot shall not fly as a member of the flight crew more than 1,000 hours in any calendar year.

12.1.3\* Rest periods for pilots of aeroplanes having three, or more, additional flight crew member(s). The following rules shall be observed in the determination of rest period of pilots of aeroplanes having three or more pilots and one or more additional flight crew member(s):

1) Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the pilot is away from his base. Adequate sleeping quarters on the aeroplane must be provided in all cases where a pilot is scheduled to fly more than twelve hours during any twenty-four consecutive hours.

2) Rest for two times hours flown. A pilot, upon return to his base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours flown since the last rest period, at his base and, during such period, will not be required to perform any duty for the airline.

12.1.3.1 Flight limitations as member of flight crew in any three calendar months. A pilot shall not fly as a member of the flight crew more than 350 hours in any three calendar months.

12.1.3.2 Flight limitations as member of flight crew. A pilot shall not fly as a member of the flight crew more than 1,000 hours in any calendar year.

#### 12.2 Pilots Not Regularly Assigned

A pilot not regularly assigned as a flight crew member under the provisions of paragraph 12.1.2 shall not fly in excess of 100 hours in any one month.

#### 12.3 Transportation to or from Duty Assignment Not Part of Rest Period

The time spent in the air, to or from duty assignment, will not be considered a part of any rest period.

#### 12.4 Total Flight Time Affecting Other Commercial Flying

A pilot shall not do other commercial flying while employed by an airline, when the combined total flight time will exceed any flight time limitation specified herein.

A pilot may however fly for pleasure (non-commercial) but the total flight time shall not be more than 30 hours in any one-month period.

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\* 12.1.3 to 12.1.3.2 applicable to international flights only.

12.5 Flight Radio Officer

12.5.1 Flight time limitation. When one pilot radio officer is required, the flight time limitations prescribed in 12.1.1 apply.

12.6 Flight Engineer

12.6.1 Flight time limitation. When one flight engineer is required, the flight time limitations prescribed in 12.1.1 apply.

12.7 Flight Navigator

12.7.1 Flight time limitation for flight navigator. When one flight navigator is required, the flight time limitations prescribed in 12.1.1 apply.

12.8 Flight Operations Officer

12.8.1 Flight Operations Officer time limitations. The following rules will govern the hours of duty for authorized flight operations officer.

a) Maximum consecutive hours of duty. No flight operations officer shall be on duty as such for a period of more than 10 consecutive hours.

b) Maximum hours of duty in 24 consecutive hours. If a flight operations officer is scheduled to be on duty as such for more than 10 hours in a period of 24 consecutive hours, he shall be given a rest period of not less than 8 hours, at or before the termination of 10 hours of flight operations officer duty except in cases of emergency or other circumstances beyond the control of the operator.

c) Flight Operations Officer's time off. Relief from all duty with the operator for not less than 24 hours shall be provided for and given each flight operations officer at least once during any consecutive 7 days, or equivalent thereto, within the calendar month.

PORTUGALApplicability of Regulations

Regulations must be developed by an operator and submitted to the State for approval. Such regulations cover all crew members and all types of operations; however, various categories of crew members are treated separately.

Regulations

- Flight time limitation (currently on trial) applicable to flight crew members.

Monthly -           80 hours - normal  
                   100 hours - normal maximum  
                   120 hours - exceptional maximum

Quarterly -   250 hours

Yearly -       1,000 hours

- General rule (currently on trial) applicable to all crew members.

Rest period equal to double the duty period.

SPAINApplicability of Regulations

Regulations developed by commercial operators which cover all flight crew members are submitted to the State for approval.

Regulations

1. - Iberia has laid down the maximum number of hours on duty and the maximum number of hours of flight time, and these figures have been tacitly approved by the State.

Maximum number of hours of flight time:

	<u>per day</u>	<u>per week</u>	<u>per month</u>	<u>per year</u>
without relief	9 h.	40 h.	110 h.	1,100 h.
with relief	12 h.	40 h.	110 h.	1,100 h.

Maximum number of hours on board aircraft:

	<u>per day</u>	<u>per week</u>	<u>per month</u>	<u>per year</u>
without relief	9 h.	40 h.	110 h.	1,100 h.
with relief	18 h.	70 h.	130 h.	1,300 h.
with relief, where sleeping accommodation is provided	24 h.	70 h.	130 h.	1,300 h.

2. - Aviación y Comercio has approved and endorsed the limitations laid down by Iberia.

SWEDENApplicability of Regulations

Regulations must be developed by operators, both scheduled and non-scheduled and submitted to the State for approval. Such procedures must apply to all flight crew members.

Regulations regarding Hours on and off DutyHours on Duty

Shall be regarded as hours on duty:

- a) the time from the prescribed hour of reporting for duty prior to departure until 30 min. after scheduled landing, unless the Company require special service after the flight;
- b) at intermediate stops, all intervals between landing and subsequent take-off which are shorter than 3 hours;
- c) the time required for transferring crew members carries as passengers in connection with a detailed flight (calculated according to a) and b) above);
- d) the time from reporting for duty until the termination of working hours in case of training, test or sight-seeing flights or assignment to ground service, link training, courses, etc.;
- e) one fourth of the time assigned to service reserve (home base reserve) after deduction for the time, up to a maximum of 9 hours in every 24, which is intended for sleep.

Reporting on Hours on Duty

Flight crew members shall be held personally to report on hours spent on duty according to the above; in case of delays, hours on duty will be calculated to last until 30 min. after the actual landing.

Hours on Duty, Compensation, and Hours off Duty on Routes where Sleeping-Berths are not AvailableLimitation of Time of Service

The following limitations shall apply to planned time of service. In case of delays and irregularities in the traffic and regulations of the Civil Aviation Authorities regarding duty on board aircraft and horizontal rest shall serve as limitations. If a crew member has been subjected to such delays that the limits of working hours would be exceeded by a planned flight, the Company shall, if possible, re-group the crew in such a manner that the limits are not exceeded.

1. The following shall apply to crews consisting of not less than 2 pilots and 1 radio operator for whom no sleeping-berths are available on board, and who are not numerous enough for the required relief to be provided:
2. The working hours shall be divided into two categories, called A and B. After consulting the organizations of the crews, SAS shall determine which routes and combinations of routes are to belong to each category. To serve as a basis for the planning it will be assumed that all routes within a radius of 4 flying hours from the home base - and in any case all inter-Scandinavian routes - will belong to Category A, while the rest will belong to Category B.

2.1 For a period of 30 consecutive days the scheduled working hours must not exceed 200 hours.

2.2 For a period of 7 consecutive days the scheduled working hours must not exceed 48 hours for Category A nor 70 hours for Category B.

2.3 For a period of 3 consecutive days the scheduled working hours must not exceed 30 hours for Category A nor 40 hours for Category B.

2.4 When, during a period of 3 consecutive days, the working time exceeds 28 hours for Category A and 36 hours for Category B, it shall be followed by at least 24 hours off duty.

2.5 For a period of 24 consecutive hours the working time for Category A must not exceed 12 hours nor the working time for Category B 14 hours.

2.6 For Category A, the working time spent on duty must not exceed 14 hours for every period of 24 hours, unless the prescribed horizontal rest can be provided between the beginning of the first period and the end of the last period on duty.

2.7 On flight service during more than 3 times 24 consecutive hours the working time must not exceed 8 hours on more than 3 out of 6 consecutive 24 hours. Crew members shall be afforded a minimum of 8 hours horizontal rest between 20.00 and 09.00 hours during each 24 hours. The latter stipulation does not apply to flight service during more than 3 consecutive 24 hours on a night route.

2.8 If, for Category B, the working time exceeds the limits fixed for Category A, the prescribed period of rest shall be provided between 20.00 and 08.00 hours.

## FLIGHT OPERATIONS MANUAL - SAS

### Planning Operations - Flight Time Limitations

In addition to the collective agreement the following rules apply for hours of duty and rest for flight personnel.

01. An aircrew member may not fly as a member of an air crew more than 1,200 hours during 12 consecutive months, 390 hours during 90 consecutive days or 130 hours during 30 consecutive days.

02. An air crew member shall be free from all duty for at least 24 consecutive hours during each 7 day period.

03. The following rules are valid for a crew consisting of at least 2 pilots and one Radio Operator and when there are no possibilities for horizontal rest on board the aircraft:

1) Flight duty during a period of 24 hours followed by a period of rest of at least 24 hours. An air crew member may not fly more than 12 hours during 24 consecutive hours. He shall during such a 24 hour period be given horizontal rest for at least 6 consecutive hours.

2) Flight duty during a period of 48 hours followed by a period of rest of at least 24 hours. An air crew member may not fly more than 10 hours during 24 consecutive hours. He shall during such a 24 hour period be given horizontal rest for at least 7 consecutive hours.



3) Flight duty during a period of 72 hours followed by a period of rest of at least 24 hours. An air crew member may not fly more than 9 hours during 24 consecutive hours. He shall during such a 24 hour period be given horizontal rest for at least 8 consecutive hours.

4) Flight duty during a period of more than 72 hours followed by a period of rest of at least 24 hours. An air crew member may not fly more than 8 hours during 24 consecutive hours. He shall during such a 24 hour period be given horizontal rest for at least 8 consecutive hours.

#### OPERATIONAL PROCEDURES

##### Planning Operations - Flight Time Limitations (Cont'd)

04. For a crew that can be given horizontal rest on board the aircraft shall, besides 01. and 02. above, special regulations be laid down for each route with regard to the length of the flight, the crew combination and other relevant factors.

05. Time spent on flight to or from flight duty shall not be considered as a rest period or part of a rest period.

06. Until further notice a crew member whose flight time exceeds 1,000 hours during a 12 month period shall be given a special medical examination after 1,000 hours' flight duty as well as every 3 months thereafter.

Note: By "fly" etc. in this instruction is understood to be "airborne time".

SWITZERLANDApplicability of Regulations

Regulations are developed by operators and are submitted to the State for approval. These regulations apply to scheduled operations and all flight crew members.

RegulationsScheduled Airlines

Limitations are as follows:

<u>1 month</u>	<u>3 months</u>	<u>6 months</u>	<u>12 months</u>
110 hours	300 hours	600 hours	900 hours

For long-distance crews, however, these figures have been altered as follows:

<u>1 month</u>	<u>3 months</u>	<u>6 months</u>	<u>12 months</u>
132 hours	375 hours	690 hours	990 hours

In addition steps have been taken to ensure appropriate rest periods for crews between flights. The rules governing rest periods vary with the nature of flights.

Annual vacation for flight crews varies from 4 to 6 weeks.

TURKEYApplicability of Regulations

Regulations are issued by an operator following approval by the State, and cover all flight crew members but only scheduled operations.

Regulations

Not more than 6 hours per day  
 25 hours per week  
 80 hours per month  
 750 hours per year.

UNION OF SOUTH AFRICAApplicability of Regulations

Regulations issued by the State apply to all flight crew members and each category is treated separately.

RegulationsFlight Time Limitations for Flight Crew and Crew MembersAeroplanes having a crew of one or two pilots

1.1.1 1) A pilot may be scheduled to fly eight hours, or less, during any twenty-four consecutive hours without a rest period during such eight hours. If a pilot is scheduled to fly in excess of eight hours during any twenty-four consecutive hours, he shall be given an intervening rest period, at, or before, the termination of eight scheduled hours of flight duty. Such rest period must equal at least twice the number of hours flown since the last preceding rest period and in no case will such rest period be less than eight hours. During such rest period the pilot must be relieved of all duty with the airline.

2) When a pilot has flown in excess of eight hours during any twenty-four consecutive hours, he must receive at least eighteen hours of rest before being assigned any duty with the airline.

3) A pilot shall not fly in excess of thirty-two hours during any seven consecutive days. Relief from all duty for not less than twenty-four consecutive hours must be provided for and given to a pilot at least once during any seven consecutive days.

4) A pilot shall not fly, as a member of the flight crew, more than 100 hours during any one month.

5) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any one calendar year.

Aeroplanes having two pilots and one additional flight crew member

1.1.2 1) A pilot may not be scheduled to fly a total of more than twelve hours during any twenty-four consecutive hours.

2) When a pilot has flown twenty hours or more during any forty-eight consecutive hours, or twenty-four hours or more during any seventy-two consecutive hours, he must receive at least eighteen hours of rest before being assigned to any duty with the airline. In any case, each pilot shall be relieved from all duty for not less than twenty-four consecutive hours during any seven consecutive days.

3) A pilot shall not fly as a member of the flight crew more than 120 hours in any one month, or 300 hours in any three calendar months.

4) A pilot shall not fly as a member of the crew more than 1,000 hours in any calendar year.

Aeroplanes having three, or more, pilots and one, or more, Additional flight crew member(s)

1.1.3 1) Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the pilot is away from his base. Adequate sleeping quarters on the aeroplane must be provided in all cases where a pilot is scheduled to fly more than twelve hours during any twenty-four consecutive hours.

2) A pilot, upon return to his base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours flown since the last rest period, at his base and, during such period, will not be required to perform any duty for the airline.

3) A pilot shall not fly as a member of the flight crew more than 350 hours in any three calendar months.

4) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any calendar year.

Pilots not Regularly Assigned

1.1.4 A pilot not regularly assigned as a flight crew member under the provisions of paragraphs 1.1.2 and 1.1.3 shall not fly in excess of 100 hours in any one month.

Transportation to and from Duty Assignment

1.1.5 The time spent in the air, to or from a duty assignment, will not be considered a part of any rest period.

Other Commercial Flying

1.1.6 A pilot shall not do other commercial flying while employed by an airline, when the combined total flight time will exceed any flight time limitation specified herein.

1.1.7 Flight crew or crew members other than pilots shall not exceed the flight times prescribed in paragraphs 1.1.1 4) and 1.1.1 5) of this Appendix.

UNITED STATES OF AMERICAApplicability of Regulations

Regulations issued by the State apply to all flight crew members and scheduled and non-scheduled operations. Various categories of flight crew members are treated differently as are different types of aircraft and air operations.

Regulations

The United States applies the following flight time limitations for scheduled international operations conducted by its air carriers. United States Non-Scheduled air carriers may also apply the same limitations when flying internationally:

"Flight time limitations for aircraft having a crew of one or two pilots

a) A pilot may be scheduled to fly 8 hours or less during any 24 consecutive hours without a rest period during such 8 hours. If a pilot is scheduled to fly in excess of 8 hours during any 24 consecutive hours, he shall be given an intervening rest period at or before the termination of 8 scheduled hours of flight duty. Such rest period must equal at least twice the number of hours flown since the last preceding rest period and in no case will such rest period be less than 8 hours. During such rest period the pilot must be relieved of all duty with the air carrier.

b) When a pilot has flown in excess of 8 hours during any 24 consecutive hours he must receive at least 18 hours of rest before being assigned any duty with the air carrier.

c) A pilot shall not fly in excess of 32 hours during any 7 consecutive days. Relief from all duty for not less than 24 consecutive hours must be provided for and given to a pilot at least once during any 7 consecutive days.

d) A pilot shall not fly as a member of the crew more than 100 hours during any one month.

e) A pilot shall not fly as a member of the crew more than 1,000 hours in any 12-month period.

Flight time limitations for aircraft having two pilots and one additional flight crew member

a) A pilot may not be scheduled to fly a total of more than 12 hours during any 24 consecutive hours.

b) When a pilot has flown 20 hours or more during any 48 consecutive hours, or 24 hours or more during any 72 consecutive hours, he must receive at least 18 hours of rest before being assigned to any duty with the air carrier. In any case each pilot shall be relieved from all duty for not less than 24 consecutive hours during any 7 consecutive days.

c) A pilot shall not fly as a member of the flight crew more than 120 hours in any 30 consecutive days or 300 hours in any 90 consecutive days.

d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period.

Flight time limitations for aircraft having three or more pilots and an additional flight crew member

a) Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the pilot is away from his base. Adequate sleeping quarters on the aircraft must be provided in all cases where a pilot is scheduled to fly more than 12 hours during any 24 consecutive hours.

b) A pilot, upon return to his base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours flown since the last rest period at his base and during such period will not be required to perform any duty for the company. When the required rest period exceeds 7 days, that portion of the rest period in excess of 7 days may be given at any time before the pilot is again scheduled for flight duty on any route.

c) A pilot shall not fly as a member of the flight crew more than 350 hours in any 90 consecutive days.

d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period.

Flight time limitations for pilots not regularly assigned. A pilot not regularly assigned as a flight crew member for an entire month under the provisions applicable to aircraft having two or three pilots and an additional flight crew member must not fly in excess of 100 hours in any 30 consecutive days."

When one flight radio operator or flight engineer or flight navigator is required the flight time limitations prescribed for 'aircraft having two pilots and one additional flight crew member' will apply. When two or more flight radio operators or flight engineers or flight navigators are required the flight time limitations prescribed for 'aircraft having three or more pilots and an additional flight crew member' will apply."

For domestic and international non-scheduled operations the following flight time limitations apply:

"Flight time limitations for pilots on large aircraft. The following limitations shall be applicable to pilots serving on large aircraft.

a) Individual pilot limitations

1) A pilot may be scheduled to fly 8 hours or less during any 24 consecutive hours without a rest period during such 8 hours.

2) A pilot shall receive 24 hours of rest before being assigned further duty when he has flown in excess of 8 hours during any 24 consecutive hours.

3) A pilot shall be relieved from all duty for not less than 24 consecutive hours at least once during any 7 consecutive days.

4) A pilot shall not fly as a crew member in air carrier service more than 100 hours during any 30 consecutive days.

5) A pilot shall not fly as a crew member in air carrier service more than 1,000 hours in any one calendar year.

6) A pilot shall not do other commercial flying if his total flying time for any specified period will exceed the limits of that period.

7) Time spent in any deadhead transportation shall in no case be considered as part of a required rest period.

b) Aircraft having a crew of two pilots

1) A pilot shall not be scheduled to fly in excess of 8 hours during any 24-hour period unless he is given an intervening rest period at or before the termination of 8 scheduled hours of flight duty. Such rest period shall equal at least twice the number of hours flown since the last preceding rest period, and in no case shall such rest period be less than 8 hours. During such rest period the pilot shall be relieved of all duty with the air carrier.

2) A pilot shall not be on duty for more than 16 hours during any 24 consecutive hours.

c) Aircraft having a crew of three pilots

1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours in any 24-hour period.

2) A pilot shall not be scheduled to be aloft for more than 12 hours in any 24-hour period.

3) A pilot shall not be on duty for more than 18 hours in any 24-hour period.

d) Aircraft having a crew of four pilots

1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours during any 24-hour period.

2) A pilot shall not be scheduled to be aloft for more than 16 hours in any 24-hour period.

3) A pilot shall not be on duty for more than 20 hours during any 24-hour period.

Flight Radio Operators and Flight Engineers

When one (flight radio operator or flight engineer) is required, the flight time limitations prescribed for "aircraft having two pilots and one additional flight crew member" will apply. When two or more (flight radio operators or flight engineers) are required, the flight time limitations prescribed for "aircraft having three or more pilots and an additional flight crew member" will apply.

Flight Navigator

The flight time limitations prescribed for "aircraft having two pilots and one additional flight crew member" apply to flight navigators.

PART II - FLIGHT CREW FATIGUE

While several States are conducting studies on various aspects of flight crew fatigue, reports on these studies, if available, would be too voluminous to be included in a Circular of this type. Accordingly with a view to acquainting States with sources of information on this subject the following brief list of reference material has been prepared with the knowledge that it contains only a few of the many useful text books and technical papers which have been issued on this subject.



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The following is a limited selection of studies on fatigue and flight fatigue providing also further references on the subject.

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## ICAO TECHNICAL PUBLICATIONS

*The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the ICAO Aeronautical Chart Catalogue or the Combined Meteorological Tables for International Air Navigation.*

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