飞行技术与空中交通管理系列教材

The Aviation Theory Course for Airline Transport Pilot

Compiled by Li Weidong
Co-compiled by Hao Jingsong He Qiuzhao

西南交通大学出版社

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航线飞行员航空理论教程

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PREFACE

Congratulations on you to continue your pilot training and welcome to The Aviation Theory Course for Airline Transport Pilot. This book is designed as a textbook and a reference for the Civil Aviation Administration of China (CAAC) knowledge Test about Airline Transport Pilot License (ATPL). The important points are summarized in the course; it is based on the study/review concept of learning: So, it has been helping pilots prepare for the test with great success.

MAIN CONTENT

All of the knowledge for the ATP is included here, and has been arranged into 8 chapters based on each subject matter. They are Chapter 1, Regulations; Chapter 2, Equipment, Navigation and Facilities; Chapter 3, Aerodynamics; Chapter 4, Performance; Chapter 5, Weight and Balance; Chapter 6, Flight Operations; Chapter 7, Flight Emergency and Hazards, Flight Physiology and Crew Resource Management; and Chapter 8, Meteorology and Weather Services. Each chapter includes main knowledge about the subject.

USE OF THE COURSE

Airman knowledge about ATP requires applicants to understand it. All of the knowledge is faced with ATPL examination. It is designed that user will have two sets of learning, understanding and reviewing the basic knowledge appropriately. The intent is that all applicants keep on eye on basic concepts, procedures and methods made from the whole chapters. These are important to airman for transport aircraft fly.

Some of the information may seem basic. There are two reasons for this: Many prospective private and commercial pilots and instrument rating knowledge are learned before, so some review is helpful; also, the airline transport knowledge is based on them but deeper than them. However, we are not going to cover all of the information, because the pilot's basic knowledge for initial pilot would be presumed up to know. If it has been a long time since you reviewed the knowledge requirements of the initial information, it might benefit you to review the Aeronautical Theory Course for Pilot (Chinese Edition, pressed by Southwest Jiaotong University Press, March, 2004).

This course is the key element in airman knowledge materials for ATPL. Although it can be studied alone, we still suggest the user to join the teaching training. You may get many more understanding from your instructors. You may learn from other materials such as CAAC aviation regulations, Flight courses and other teaching materials provided by ATP training organizations. Then, you will be excellent to pass the theory test for ATPL.

This introduction has implied a heavy emphasis on knowledge exams, but that is not our style as an instructor. What you need to know for the knowledge test represents less than the course text — the rest is solid information you must study from the Chinese Civil Aviation Regulations (CCAR, i.e. CCAR 61, CCAR 91, CCAR 121 and so on) and other reference books.

You will also note an emphasis on computer-based training system (CBT). Most pilots are to some extent technically oriented, and it is estimated that well over all pilots use airline computers for flight planning, acquiring weather information, maintaining their logbooks, etc. Accordingly, we have included access information wherever it is appropriate. As CBT surfers know, if you can find one-by-one question showed on the computer, then you choice only one correct answer for the question with clicking the mouse button. And then you will get hold of all of the ATP knowledge gradually.

Finally, we shall give thanks to the writers of this course; they are Ma Zhigang, Luo Jun, Hao Jingsong, Wei Lin, Liu Duhui, Xiang Xiaojun, Yang Junli, Fang Xuedong, Jiang Bo, He Qiuzhao, Li Weidong, Mou Haiying, Huang Yifang, Zou Bo and Chen Huizhi. This course is compiled by Li Weidong, Hao Jingsong and He Qiuzhao. All of the writers are the experts about aviation theory and come from the Civil Aviation Flight University of China. We believe it is a great contribution for CAAC.

We wish this book will provide a good reference to you. We are confident that with proper use of this book, you will score very well on any of the Airline Transport Pilot tests.

CONTENTS

CHAPTER 1 REGULATIONS

SECTION A APPLICABLE REGULATIONS

"CCAR" is used as the acronym for "China Civil Aviation Regulations". Those regulations or rules are very important for operations of aircraft, and other aspects in that field. The regulations change frequently, and answer all questions in compliance with the most current regulations.

Two different China Civil Aviation Regulations can apply to operations of aircraft covered by this chapter: CCAR 91, 121. CCAR 91 encompasses the general operations and flight rules for all aircraft operating within the Peoples' Republic of China. Often the rules of CCAR 121 supplement or even supersede CCAR 91. When an aircraft is not operated for compensation, only the CCAR 91 rules apply. For the test, assume CCAR 121 rules apply unless the question specifically states otherwise. CCAR 121 applies to air carriers (airlines) engaged in China or overseas air transportation. Carriers which operate under CCAR 121 are engaged in common carriage. This means that they offer their services to the public and receive compensation for those services.

CCAR 121 operators are subdivided into three categories. Carriers authorized to conduct scheduled operations within China are domestic air carriers. Flag carriers conduct scheduled operations inside and outside China. A supplemental carrier conducts its operations anywhere that its operations specifications permit but only on a non-scheduled basis. There is a fourth category, commercial operators of large aircraft, but they must comply with the rules covering supplemental carrier and the distinction is unimportant to this discussion.

Other parts of the regulations apply as well. CCAR 61 governs certifications of pilots and flight instructors. CCAR 67 covers the issuing and standards for medical certificates. CCAR 65 prescribes the requirements for issuing certificates and associated ratings and the general operating rules for the holders of those certificates and ratings.

SECTION B THE ATP CERTIFICATE

The pilot-in-command of an air carrier flight must hold an Airline Transport Pilot (ATP) certificate with the appropriate type rating. The co-pilot on an air carrier flight that requires only

two pilots need only hold a Commercial Pilot certificate (with an Instrument rating) with the appropriate category and class ratings.

A person must hold a type rating to act as pilot-in-command of a large aircraft (over 5 700 kg gross take-off weight), or of a turbojet-powered airplane.

Any type rating(s) on the pilot certificate of an applicant who successfully complete an ATP checkride will be included on the ATP Certificate with the privileges and limitations of the ATP Certificate, provided the applicant passes the checkride in the same category and class of aircraft for which the applicant holds the type rating(s). However, if a type rating for that category and class of aircraft on the superseded pilot certificate is limited to VFR, that limitation will be carried forward to the person's ATP Certificate level.

An airline transport pilot may instruct other pilots in air transportation service in aircraft of the category, class and type for which he/she is rated. However, the ATP may not instruct for more than 8 hours in one day.

A person who has lost an Airman's Certificate may obtain a temporary certificate from the CAAC. The temporary certificate is valid no more than 120 days.

A crewmember is a person assigned to duty in the aircraft during flight. This includes pilots, flight engineers, navigators, flight attendants or anyone else assigned to duty in the airplane. A flight crewmember is a pilot, flight engineer or flight navigator assigned to duty in the aircraft during flight.

No person may serve as a pilot on an air carrier after that person has reached his/her 60th birthday. Note that this rule applies to any pilot position in the aircraft, but it does not apply to other flight crew positions such as flight engineer or navigator.

To exercise ATP privileges (such as pilot-in-command of an air carrier flight) a pilot must hold a First-Class Medical Certificate issued within the preceding 6 or 12 calendar months. To exercise commercial pilot privileges (e.g., co-pilot on a two-pilot air carrier flight) a pilot must hold either a First- or Second-Class Medical Certificate issued within the preceding 12 or 24 calendar months.

The applicant is not required to hold a medical certificate when taking a test or check for a certificate, rating, or authorization conducted in a flight simulator or flight training device.

SECTION C FLIGHT ENGINEER REQUIREMENTS

Many air carrier aircraft have a flight engineer as a required flight crewmember. The aircraft "type certificate" states whether or not a flight engineer is required. On each flight requiring a flight engineer at least one flight crewmember, other than the flight engineer, must be qualified to provide emergency performance of the flight engineer's functions for the safe completion of the flight if the flight engineer becomes ill or is otherwise incapacitated. A pilot need not hold a Flight Engineer's Certificate to perform the flight engineer's functions in such a situation.

SECTION D FLIGHT ATTENDANTS

One or more flight attendants are required on each passenger-carrying airplane that has more than 19 passenger seats. The number of flight attendants is determined by the number of installed passenger seats — not by the actual number of passengers on board. Each certificate holder shall provide at least the minimum number of flight attendants on each passenger-carrying airplane. For airplanes having a seating capacity of more than 20 but less than 50 passengers: at least one flight attendant. For airplanes having a seating capacity of more than 51 but less than 100 passengers: at least two flight attendants. For airplanes having a seating capacity of more than 100 passengers: at least two flight attendants plus one additional flight attendant for each unit (or part of a unit) of 50 passenger seats above a seating capacity of 100 passengers.

If, in conducting the emergency evacuation demonstration required under CCAR 121, the certificate holder used more flight attendants than is required under the paragraph above of this section for the maximum seating capacity of the airplane, he may not, thereafter, take off that airplane in its maximum seating capacity configuration with fewer flight attendants than the number used during the emergency evacuation demonstration; or in any reduced seating capacity configuration with fewer flight attendants than the number required by the paragraph above of this section for that seating capacity plus the number of flight attendants used during the emergency evacuation demonstration that were in excess of those required under the paragraph above of this section.

The number of flight attendants approved under the paragraphs above of this section is set forth in the certificate holder's operations specifications. During take-off and landing, flight attendants required by this section shall be located as near as practicable to required floor level exists and shall be uniformly distributed throughout the airplane in order to provide the most effective egress of passengers in event of an emergency evacuation. During taxi, flight attendants required by this section must remain at their duty stations with safety belts and shoulder harnesses fastened except to perform duties related to the safety of the airplane and its occupants.

At stops where passengers remain on board, and on the airplane for which a flight attendant is not required by CCAR 121, the certificate holder must ensure that a person who is qualified in the emergency evacuation procedures for the airplane as required in CCAR 121, and who is identified to the passengers, remains on board the airplane, or nearby the airplane, in a position to adequately monitor passenger safety; and the airplane engines are shut down; and at least one floor level exit remains open to provide for the deplaning of passengers.

On each airplane for which flight attendants are required by CCAR 121, but the number of flight attendants remaining aboard is fewer than required by CCAR 121, the certificate holder shall ensure that the airplane engines are shut down, and at least one floor level exit remains open to provide for the deplaning of passengers; and the number of flight attendants on board is at least half the number required by CCAR 121, rounded down to the next lower number in the case of fractions, but never fewer than one. The certificate holder may substitute for the required flight attendants

other persons qualified in the emergency evacuation procedures for that aircraft as required in CCAR 121, if these persons are identified to the passengers. If only one flight attendant or other qualified person is on board during a stop, that flight attendant or other qualified person shall be located in accordance with the certificate holder's CAAC-approved operating procedures. If more than one flight attendant or other qualified person is on board, the flight attendants or other qualified persons shall be spaced throughout the cabin to provide the most effective assistance for the evacuation in case of an emergency.

SECTION E EXPERIENCE AND TRAINING REQUIREMENTS

For these definitions of training, aircraft are divided into two "groups". Group I aircraft are propeller driven. Turbojet aircraft are Group II. Initial training is the training required for crewmembers and dispatchers who have not qualified and served in the same capacity (i.e., flight engineer, co-pilot, pilot-in-command) on another aircraft of the same group. Transition training is the training required for crewmembers or dispatchers who have qualified and served in the same capacity on another aircraft of the same group. Upgrade training is the training required for crewmembers who have qualified and served as second-in-command or flight engineer on a particular airplane type (e.g., Boeing 737) before they can serve as pilot-in-command or second-in-command, respectively, on that airplane. Differences training is the training required for crewmembers or dispatchers who have qualified and served on a particular type of airplane before they can serve in the same capacity on a variation of that airplane. For example, a crewmember who is qualified on a Boeing 737-300 would need differences training to serve on a Boeing 737-400.

For a person to serve as pilot-in-command he/she must have had a proficiency check within the preceding 12 calendar months. In addition, within the preceding 6 calendar months the pilot-in-command must have either passed a proficiency check or completed an approved simulator training course. No certificate holder may use any person nor may any person serve as pilot-in-command of an airplane unless, within the preceding 12 calendar months that person has passed a line check in which he/she satisfactorily performs the duties and responsibilities of a pilot-in-command in one of the types of airplanes to be flown.

Pilots other than the PIC (pilot-in-command) must have either passed a proficiency check or completed "line oriented" simulator training within the last 24 calendar months. In addition, the co-pilot must have had a proficiency check or any other kind of simulator training within the last 12 calendar months.

Whenever a crewmember or aircraft dispatcher who is required to take recurrent trainings, a flight check, or a competency check, takes the check or completes the training in the calendar month before or after the month in which that training or check is required, he/she is considered to have taken or completed it in the calendar month in which it was required.

When a pilot has not made 3 take-offs and landings within the preceding 90 days, the pilot

must make at least 3 take-offs and landings in the type of airplane in which that person is to serve or in an advanced simulator. These take-offs and landings must include:

A. At least 1 take-off with a simulated failure of the most critical powerplant;

B. At least 1 landing from an ILS (Instrument Landing System) approach to the lowest ILS minimum authorized for the certificate holder; and

C. At least 1 landing to a full stop.

No pilot may act as pilot-in-command under IFR (Instrument Flight Rule) unless he/she has, within the preceding 6 calendar months in the aircraft category for the instrument privileges sought, logged at least 6 instrument approaches, performed holding procedures, and intercepted and tracked courses through the use of navigation systems, or passed an instrument competency check in the category of aircraft involved.

A pilot may log as instrument flight time only that time during which he/she operates the aircraft solely by reference to the instruments, under actual or simulated instrument flight conditions.

If the pilot-in-command has not served 100 hours as pilot-in-command in operations under CCAR 121 in the type of airplane he/she is operating, the MDA (minimum descent altitude) or DH (decision height) and visibility landing minimums in the certificate holder's operations specifications for regular, provisional, or refueling airports are increased by 100 feet and 800 m [or the RVR (runway visual range) equivalent]. If the pilot-in-command has not served 100 hours as PIC under CCAR 121 operations in the airplane type, the MDA or DH visibility minimums are increased by 30 m and 800 m above the published minimums. If a flight goes to an alternate airport, the minimums do not have to be raised by 30 ~ 800 m, but they can not be less than 100 ~ 1 600 m. In addition, Category II (CAT II) minimums and the sliding scale do not apply. If a pilot has at least 100 hours PIC in another aircraft under CCAR 121 operations, he/she may reduce the current restriction by 1 hour for each landing, up to 50 hours maximum.

To be eligible for Category II authorization, a pilot must have made at least 6 ILS approaches since the beginning of the 6th month before the test. These approaches must be under actual or simulated instrument flight conditions down to the minimum landing altitude for the ILS approach in the type aircraft in which the flight test is to be conducted. However, the approaches need not be conducted down to the decision heights authorized for Category II operations. At least 3 of these approaches must have been conducted manually, without the use of an approach coupler.

Upon original issue, a Category II authorization contains a limitation for Category II operations of 1 600 feet RVR and a 150-foot decision height. This limitation is removed when the holder shows that since the beginning of the 6th preceding month he/she has made 3 Category II ILS approaches to a landing under actual or simulated instrument conditions with a 150-foot decision height.

No domestic or flag air carrier may use any person as an aircraft dispatcher unless, within the preceding 12 calendar months, he/she has satisfactorily completed operating familiarization consisting of at least 5 hours observing operations from the flight deck under CCAR 121 in one of the types of airplanes in each group he/she is to dispatch.

SECTION F FLIGHT CREW DUTY TIME LIMITS

The time limits in this section count all commercial flying done by the crewmember in any flight crew position, not just the time flown with the air carrier. Besides the limits on flight time, there are required periods of rest based on the amount of flying done within a 24-hour period. There is also a requirement that a flight crewmember be given at least 36 consecutive hours of rest in any 7 consecutive days periods. A person cannot be assigned to any ground or flight duties during required rest periods. The term "deadhead" is used to describe the transportation of crewmembers by the air carrier to or from their flight assignments when that transportation is not local in character. Time spent in deadhead air transportation cannot be considered part of a required rest period.

No pilot of a supplemental carrier may be on flight deck duty for more than 8 hours in any 24 consecutive hours. If three pilots are assigned to a flight, the crew can be aloft no more than 16 hours in any 24 consecutive hours.

PILOTS' DUTY PERIOD LIMITATIONS AND REST REQUIREMENTS

Two Pilots Crews

A crewmember's total duty period should not exceed 14 hours, and the flight time in the duty period should not exceed 8 hours. The flight time may be extended to 9 hours if there are no more than 2 segments in the flight. After the duty period the crewmember must be given a scheduled rest period of at least 10 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case of any delays happening in the operation, the rest period may be reduced to 9 hours, if the actual duty period doesn't exceed the 14 hours' limitation. In case of any delays happening in the operation, the duty period may be extended to 16 hours at most, but the rest period there after must not be reduced.

Three Pilots Crews, Including a Second-in-commander Pilot

A crewmember's total duty period should not exceed 16 hours, and the flight time in the duty period should not exceed 10 hours. The flight time may be extended to 9 hours if it is a nonstop flight. After the duty period the crewmember must be given a scheduled rest period of at least 14 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case of any delays happening in the operation, the rest period may be reduced to 12 hours, if the actual duty period doesn't exceed the 16 hours' limitation. In case of any delays happening in the operation, the duty period may be extended to 18 hours at most, but the rest period there after must not be reduced.

Three Pilots Crews, Including a Second-in-commander Pilot, and an Approved Area of Sleep for Crewmembers During the Flight

A crewmember's total duty period should not exceed 18 hours, and the flight time in the duty

period should not exceed 14 hours, provided each crewmember could have chances to take a rest in the approved area of sleep during the whole flight. After the duty period the crewmember must be given a scheduled rest period of at least 18 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case of any delays happening in the operation, the rest period may be reduced to 16 hours, if the actual duty period doesn't exceed the 18 hours' limitation. In case of any delays happening in the operation, the duty period may be extended to 20 hours at most, but the rest period there after must not be reduced.

Four Pilots Crews, Including a Second-in-commander Pilot, and an Approved Area of Sleep for Crewmembers During the Flight

A crewmember's total duty period should not exceed 20 hours, and the flight time in the duty period should not exceed 17 hours, provided each crewmember could have chances to take a rest in the approved area of sleep during the whole flight. After the duty period the crewmember must be given a scheduled rest period of at least 22 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case of any delays happening in the operation, the rest period may be reduced to 20 hours, if the actual duty period doesn't exceed the 20 hours' limitation. In case of any delays happening in the operation, the duty period may be extended to 22 hours at most, but the rest period there after must not be reduced.

DUTY PERIOD LIMITATIONS AND REST REQUIREMENTS: NAVIGATORS, FLIGHT ENGINEERS AND BATMEN

Duty Period Limitations and Requirements for a Crew with One Navigator, One Flight Engineer, or One Batman

A crewmember's total duty period should not exceed 14 hours, and the flight time in the duty period should not exceed 9 hours. After the duty period the crewmember must be given a scheduled rest period of at least 10 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case any delays occur during the operation, the rest period may be reduced to 9 hours, if the actual duty period doesn't exceed the 14 hours' limitation; the duty period may be extended to 16 hours at most, but the 10 hours' rest period there after must not be reduced.

A certificate holder may assign a navigator, a flight engineer, or batman to a scheduled duty period of more than 14 hours, but no more than 16 hours. The flight time during the duty period should not exceed 12 hours. After the duty period the crewmember must be given a scheduled rest period of at least 14 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case any delays occur during the operation, the rest period may be reduced to 12 hours, if the actual duty period

doesn't exceed the 16 hours' limitation; the duty period may be extended to 18 hours at most, but the 14 hours' rest period there after must not be reduced.

Duty Period Limitations and Requirements for a Crew with Two Navigators, Two Flight Engineers, or Two Batmen

A certificate holder may assign navigators, flight engineers, or batmen to a scheduled duty period of more than 16 hours, but no more than 18 hours. The flight time during the duty period should be no more than 14 hours, provided each crewmember could have chances to take a rest in the approved area of sleep during the whole flight. After the duty period the crewmember must be given a scheduled rest period of at least 18 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case any delays occur during the operation, the rest period may be reduced to 16 hours, if the actual duty period doesn't exceed the 18 hours' limitation; the duty period may be extended to 20 hours at most, but the 18 hours' rest period there after must not be reduced.

A certificate holder may also assign navigators, flight engineers, or batmen to a scheduled duty period of more than 18 hours, but no more than 20 hours. The flight time during the duty period should be no more than 17 hours, provided each crewmember could have chances to take a rest in the approved area of sleep during the whole flight. After the duty period the crewmember must be given a scheduled rest period of at least 22 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period. In case any delays occur during the operation, the rest period may be reduced to 20 hours, if the actual duty period doesn't exceed the 20 hours' limitation; the duty period may be extended to 22 hours at most, but the rest period there after must not be reduced.

FLIGHT TIME LIMITATIONS AND REST REQUIREMENTS: FLIGHT CREWMEMBERS

No certificate holder conducting operations may schedule any flight crewmember and no flight crewmember may accept an assignment for flight time in scheduled air transportation or in other commercial flying if that crewmember's total flight time in all commercial flying will exceed 1 000 hours in any calendar year, or 90 hours in any calendar month, or 35 hours in any 7 consecutive calendar days (this period of time may be extended to 40 hours, provided each crewmember could have a chance to take a rest in an approved area of sleep during each period of flight).

ADDITIONAL DUTY PERIOD AND FLIGHT TIME LIMITATIONS: FLIGHT CREWMEMBERS

A flight crewmember is not considered to be scheduled for duty time in excess of duty time limitations if the flights to which he is assigned are scheduled and normally terminate within the limitations, but due to circumstances beyond the control of the certificate holder (such as adverse

weather conditions), are not at the time of departure expected to reach their destination within the scheduled time. In this case, the duty period and flight time limitations should also be consistent with those stated in CCAR 121, and the excess part of duty time should not in any circumstances exceed 2 hours.

A flight crewmember is not considered to be scheduled for flight time in excess of flight time limitations if the flights to which he is assigned are scheduled and normally terminate within the limitations, but due to circumstances beyond the control of the certificate holder (such as adverse weather conditions), are not at the time of departure expected to reach their destination within the scheduled time.

If a flight crewmember is assigned to serve for more than one certificate holder, or is assigned to serve in more than one type of flight crew, the total duty time and flight time limitations should be consistent with those stated in CCAR 121.

Time spent before departure due to delay is considered part of the duty time.

ADDITIONAL REST REQUIREMENTS: FLIGHT CREWMEMBER

No certificate holder may assign a flight crewmember to perform any duty with the certificate holder during any required rest period. The rest period stated in this section may be included in other rest periods.

Only when a delay occurs in an operation, may a crewmember's rest period be reduced according to those stated in CCAR 121. The reducing must not be assigned ahead of time.

Each certificate holder shall relieve each flight crewmember engaged in scheduled air transportation from all further duty for at least 36 consecutive hours during any 7 consecutive days.

When a certificate holder assigned other duty for a flight crewmember, the time spent in the duty may or may not be considered as part of the flight duty time. When it is not considered as part of the flight duty time, the flight crewmember must be assigned a rest period of at least 8 consecutive hours before commencement of the subsequent duty period.

If there is a jetlag of 6 hours or more between the time zone where the flight operation terminates and the time zone where the flight crewmember's home station locates, the certificate holder should assigned a rest period of at least 48 consecutive hours for the flight crewmember after he or she is back to the home station. This rest period must occur before the commencement of the subsequent duty period. The home station stated in this section refers to the place where flight crewmembers are stationed, and flight crewmembers' duty times are assigned there.

Time spent in transportation, not local in character, that a certificate holder requires of a flight crewmember and provides to transport the flight crewmember to an airport at which that flight crewmember is to serve on a flight as a crewmember, or from an airport at which the flight crewmember was relieved from duty to return to the flight attendant's home station, is not considered part of a rest period.

FLIGHT ATTENDANT DUTY PERIOD LIMITATIONS AND REST REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

Calendar day means the period of elapsed time, using Coordinated Universal Time or local time, which begins at midnight and ends 24 hours later at the next midnight. Duty period means the period of elapsed time between reporting for an assignment involving flight time and release from that assignment by the certificate holder conducting domestic, flag, or supplemental operations. The time is calculated using either Coordinated Universal Time or local time to reflect the total elapsed time. Flight attendant means an individual, other than a flight crewmember, who is assigned by a certificate holder conducting domestic, flag, or supplemental operations, in accordance with the required minimum crew complement under the certificate holder's operations specifications or in addition to that minimum complement, to duty in an aircraft during flight time and whose duties include but are not necessarily limited to cabin-safety-related responsibilities. Rest period means the period free of all restraint or duty for a certificate holder conducting domestic, flag, or supplemental operations and free of all responsibilities for work or duty should the occasion arise.

A certificate holder conducting domestic, flag, or supplemental operations may assign a duty period to a flight attendant only when the following applicable duty period limitations and rest requirements are met.

A. Except as provided in paragraphs D, E, and F of this section, no certificate holder conducting domestic, flag, or supplemental operations may assign a flight attendant to a scheduled duty period of more than 14 hours.

B. Except as provided in paragraph C of this section, a flight attendant scheduled to a duty period of 14 hours or less as provided under paragraph A of this section must be given a scheduled rest period of at least 9 consecutive hours. This rest period must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period.

C. The rest period required under paragraph B of this section may be scheduled or reduced to 8 consecutive hours if the flight attendant is provided a subsequent rest period of at least 10 consecutive hours; this subsequent rest period must be scheduled to begin no later than 24 hours after the beginning of the reduced rest period and must occur between the completion of the scheduled duty period and the commencement of the subsequent duty period.

D. A certificate holder conducting domestic, flag, or supplemental operations may assign a flight attendant to a scheduled duty period of more than 14 hours, but no more than 16 hours, if the certificate holder has assigned to the flight or flights in that duty period at least one flight attendant in addition to the minimum flight attendant complement required for the flight or flights in that duty period under the certificate holder's operations specifications.

E. A certificate holder conducting domestic, flag, or supplemental operations may assign a flight attendant to a scheduled duty period of more than 16 hours, but no more than 18