Belize Department of Civil Aviation

ADVISORY CIRCULAR

Subject: **Training Reference Guide - FLIGHT OPERATIONS OFFICERS/FLIGHT DISPATCHERS**
Initiated by: BDCA- Flight Standards

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1. THE PURPOSE OF THIS ADVISORY CIRCULAR.

This document contains acceptable methods for approved courses of training, based on the requirements of Annexes 1 and 6 to the ICAO Convention and on the generally accepted scope and nature of the requirements and duties of such Officers. It has been developed in order to provide general guidance and principles to designing and delivering of training to applicants/candidates as Flight Operations Officers/Flight Dispatchers.

2. WHAT THIS AC CANCELS

Not Applicable.

3. WHO THIS AC AFFECTS.

This AC applies to all Belize Air Operator (AOC) Holders and individuals that are willing to enroll training for the purpose to apply and obtain a Flight Operations Officer/Flight Dispatcher License.

Note.- BCAR APL is in the process to be amended to incorporate the requirements for the issue of the license for Flight Operations Officer/Flight Dispatcher (Ref.: Annex 1, 4.6)

4. WHERE TO GET A COPY OF THIS AC.

You can ask for a copy of this AC at the BDCA Technical Library or download from the BDCA website at www.civilaviation.gov.bz

DEPT OF CIVIL AVIATION BELIZE

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Director of Civil Aviation

TRAINING REFERENCEGUIDE
(For Flight Operations Officer/Flight dispatchers)

1. GENERAL.

Advisory Circulars (ACs) are issued by the Belize Department of Civil Aviation (BDCA) and contain information regarding standards, practices and recommendations acceptable to the Belize Department of Civil Aviation (BDCA). The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

2. PURPOSE.

This AC is issued to provide general guidance and principles for the purpose of designing and delivering of training to applicants/candidates as Flight Operations Officers/Flight Dispatchers.

3. APPLICABILITY.

This AC applies to all Belize Air Operator (AOC) Holders and individuals that are willing to enroll training for the purpose to apply and obtain a Flight Operations Officer/Flight Dispatcher License.

Note.- BCAR APL is in the process to be amended to incorporate the requirements for the issue of the license for Flight Operations Officer/Flight Dispatcher (Ref.: Annex 1, 4.6)

4. CANCELLATION.

This AC is the first version.

5. EFFECTIVE DATE.

26/05/2017

6. REFERENCES.

BCAR OPS 1, BCAR OPS 3, ICAO Annex 1, ICAO Annex 6, Training Manual for Flight Operations Officers/Flight Dispatchers, (ICAO Doc. Doc 7192-AN/857 Part D-3), the Belize Civil Aviation Act

7. INTRODUCTION.

The Third Air Navigation Conference of ICAO held in Montreal in 1956 formed the basis for consideration of the subjects that varied from simple dispatching, where the ground personnel's primary function was to assist the pilot-in-command in pre-flight planning, to en-route and post-flight assistance to the pilot-in-command, where many of the duties for the operation were shared by the ground personnel.
Emphasis was placed on the responsibility for obtaining and providing information of interest to aircraft in flight.

The discussions were mostly related to the provision of meteorological information, and little clarification of the general concept and purpose of operational control resulted.

Over the intervening years, however, many States came to the conclusion that for the efficient and safe flow of air traffic, it was necessary to have supervision of flight operations. Flight Operations Officers, also known as Flight Dispatchers or Aircraft Dispatchers, were therefore introduced to provide such supervision and act as a close link between aircraft in flight and the ground services, and also between the crew members and the operator's ground staff.

In time, as the nature of the requirement for flight operations officers/flight dispatchers (FOO/FDs)

stabilized and the scope of their duties and responsibilities became more defined, it was deemed necessary to establish knowledge and experience requirements and licensing provisions and these are contained in Annex 1 to the Convention on International Civil Aviation. Although these officers are not issued with licenses or certificates in some States, the need for their appropriate training and qualification has been accepted throughout the world and has been provided for in international Standards and Recommended Practices.

These guidelines are based on the Flight Operations Officers/Flight Dispatchers Training Manual, Part D-3 of Doc 7192. It contains acceptable methods for approved courses of training, based on the requirements of Annexes 1 and 6 and on the generally accepted scope and nature of the requirements and duties of such officers.

The second edition of Doc 7192, Part D-3 contains training syllabi for flight operations officers/flight dispatchers covering knowledge requirements and applied practical training. Subject matter that must be addressed during phase one and phase two training as indicated in this AC Training reference guide which also includes the approximate duration of the course (both for basic training and re-qualification training) and the degree of expertise required in each subject. Details of training included in this AC and in the Doc. 7192, Part D-3 are not all-inclusive and are provided as the minimum requirements for the training of flight operations officers/flight dispatchers. The training syllabus of FOO/FDs assigned to duties on the basis of the requirements of Annexes 1 and 6 must include syllabi suggested in this AC and in the Doc. 7192, Part D-3 but should not be limited by it.

8. TRAINING PRINCIPLES

8.1 Regulatory requirements

8.1.1 Paragraph 4.2.1.3 of Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport— Aeroplanes*, requires that operators demonstrate an adequate organization, method of control and supervision of flight operations, training programme and maintenance arrangements consistent with the nature and extent of the operations specified. A flight operations officer/flight dispatcher (FOO/FD) is normally employed to provide supervision of flight and to act as a close link between aircraft in flight and the ground services, and also between the aircrew and the operator's ground staff. The duties of flight operations officers/flight dispatchers are specified in section 4.6 of Annex 6, Part I.

8.1.2 The requirements in respect of age, knowledge, experience and skill for the licensing of flight operations officers/flight dispatchers, when employed in conjunction with a method of flight supervision in accordance with 4.2.1 of Annex 6, Part I, are detailed in Annex 1 — *Personnel Licensing*. Annex 1 and Annex 6 specifications are used by States as a basis for their national regulations both for the licensing of flight operations officers/flight dispatchers and for approving operators' flight supervisory systems and the training of said personnel.

8.1.3 The successful application of regulations concerning the safety and regularity of aircraft operation and the achievement of regulatory objectives are greatly dependent on the appreciation by all individuals concerned of the risks involved and on a detailed understanding of the regulations. This can only be achieved by properly planned and maintained initial and recurrent training programmes for all persons involved in aircraft operation. Flight operations officers/flight

dispatchers play a significant role in the safe operation of an aircraft and international regulations require that they be appropriately trained.

8.2 Training requirements

8.2.1 Principal duties

8.2.1.1 The principal duties of the flight operations officer/flight dispatcher (FOO/FD) as specified in Annex 6, Part I, are:

a) assist the pilot-in-command in flight preparation and provide the relevant information required

b) assist the pilot-in-command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit

c) furnish the pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight and;

d) in the event of an emergency, initiate such procedures as may be outlined in the operations manual.

8.2.1.2 It must be noted that some States go beyond Annex 6 requirements and prescribe the sharing of responsibility between the pilot-in-command and the FOO/FD for certain elements affecting the safety of flight operations. For example, in one State this is regulated along the following lines:

"Joint responsibility of aircraft dispatcher and pilot-in- command: The aircraft dispatcher and the pilot-in-command shall be jointly responsible for the preflight planning, delay, and dispatch release of the flight in compliance with ... appropriate regulations."

8.2.1.3 In both situations, the FOO/FD relieves the pilot-in-command of a considerable burden by providing him with the opportunity to consult on critical and non-critical issues with professionals who are familiar with all factors bearing on an operation and have the knowledge of the whole network of operations of which any particular flight is only a part.

8.2.1.4 During flight, a continued assessment of flight conditions, the monitoring of fuel adequacy and the recommendation of alternative plans such as diversion necessitate an extension of the pre-flight duties throughout the course of the actual flight operation. The advent of improved ground/air communications allows the FOO/FD to relay to aircraft information received after it has become airborne, thus increasing the value of the "inflight" assistance.

8.2.1.5 The FOO/FD not only contributes to the safety and regularity of flight operations but also makes a positive contribution to the economy and efficiency of aircraft operation by improving the payload, reducing excessive fuel reserve, positioning or repositioning the aircraft more efficiently, and saving flying hours by reducing the number of abortive flights. The FOO/FD must constantly know the position and monitor the progress of all flights in his area, and this involves a constant process of analysis, evaluation, consultation and decision. The FOO/FD must at all times have the courage of his convictions and let nothing influence him contrary to his better judgement.

8.2.1.6 In applying these basic philosophies and, in particular, bearing in mind the need to keep the aircraft operating safely and efficiently, the FOO/FD must always:

a) plan conservatively;

b) failing normal operation, plan so as to give the best alternative service; and

c) keep flights operating on schedule in so far as possible.

8.2.1.7 Planning must be based upon realistic assumptions since the inevitable results of over optimism are delays, inconvenience to passengers and uneconomical utilization of the aircraft, all of which can impact the safety of the operation.

8.2.1.8 In preparing the necessary basic material and criteria that will help the pilot-in-command decide on some of the essential features of each flight, the FOO/FD must:

a) consult with the meteorological office and refer to meteorological information, as necessary;

b) issue information concerning operations plans to the appropriate departments of the operator's organization;

c) issue such instructions concerning aircraft and crew utilization as are necessary to the appropriate departments of the operator's organization;

d) consider with the pilot-in-command the existence of, and method of ensuring compliance with, noise abatement procedures;

e) ascertain load requirements;

f) determine load availability;

g) outline to the pilot-in-command what may be expected in the way of en-route and terminal weather, explain how other flights have been planned or what they have encountered en route, indicating their altitude, procedure, ground speed, etc., and offer suggestions that may be of help to the pilot-in-command in his flight planning;

h) advise the pilot-in-command on the routes, altitudes, tracks and technical stops that will be necessary and what alternate aerodromes are considered suitable for the various terminals, and why;

i) determine fuel requirements, aircraft gross weight and balance (the pilot-in-command makes an independent calculation);

j) bring to the pilot-in-command's attention any irregular operation of airport, airway, navigation or communication facilities, with particular regard to noise curfews affecting the availability of airports; and

k) outline what may be expected in the way of delays to or irregularities in the flight while en route or what is expected of other flights operating over the route at the same time.

8.2.1.9 During the in-flight stage, the FOO/FD must be ready to assist the pilot-in-command, for example:

a) by issuing such instructions concerning revised plans for aircraft and crew utilization as are necessary to the appropriate departments of the operator's organization, if a diversion, flight return, en-route delay, or cancellation occurs

b) by recommending revised routes, altitudes and alternates

c) by advising the pilot-in-command of commercial and technical considerations of which he could not be aware and which could influence operational decisions, such as enforced diversion to an alternate destination

d) by monitoring adequacy of remaining fuel and;

e) by supplying or arranging for the supply of supplementary information (including significant weather information, irregularities in operation of navigation and communication facilities, etc.) to the pilot.

8.2.1.10 When such irregularities in flight operations occur, the FOO/FD must look far ahead and consider the many factors involved in order to determine the most practical plan or solution. Some of the main factors are as follows:

a) How long will the flight be delayed, or when is it expected to operate?

b) How long can the flight be delayed?

Note.— The exigencies of crew flight time limitation legislation render this consideration one of the critical factors in flight departure delays or flight time extension. The possible need to warn a fresh crew or to revise the flight schedule must be foreseen and planned for.

c) In the event that the flight is delayed beyond the maximum limit established or is cancelled, what is the best alternative for passengers and cargo?

d) How will the delay affect other sections of the airline and can they keep operating on schedule?

e) Is there an aircraft available to originate the flight at the next terminal ahead and what is the most practical time to so originate?

f) What is the second best point to originate the flight?

g) What is the latest time the flight can originate and still allow necessary placement of aircraft?

h) Is there revenue available at the time origination is most desired?

i) If necessary to cancel, what is the best time in order to fit in with alternative transportation?

j) How can the plans of an FOO/FD be integrated by the FOO/FD who will next handle the flight?

8.2.1.11 In the event of a security incident on an aircraft, the FOO/FD assumes significant responsibilities for the operational aspects of any actions initiated from the ground. He must also be prepared to render the pilot-in-command and crew every possible assistance during the emergency.

8.2.1.12 Delays in and irregularities of operation often upset crew members and passengers and may significantly affect aircraft cycles. Therefore, it is necessary for the FOO/FD to check closely with the operator's departments responsible for crew and aircraft routing in order to maintain a well-balanced positioning of crew and aircraft for the smooth operation of all flights.

8.2.1.13 These are some of the factors that normally govern the day-to-day practical work of the FOO/FD. The degree of responsibility given to him varies from State to State and from operator to operator. It varies from the complex level where the FOO/FD is almost considered the counterpart of the pilot-in-command, to a position of limited importance. In the former case, he is normally required to be licensed, enabling him to sign and approve operational flight plans. While in the latter case, his duties may be limited to clerical assistance only. There is a marked tendency, however; for States and operators to make increased use of FOO/FDs, giving them extensive duties and responsibilities.

8.2.1.14 To undertake the duties and responsibilities described above, an FOO/FD must be appropriately trained in all the subjects required for adequate control and supervision of aircraft operation. As a specialist, an FOO/FD needs to demonstrate a high sense of responsibility, dependability and the ability to think clearly and to make appropriate decisions as required. The training of FOO/FDs should, invariably, include several stages of selection in order to eliminate trainees lacking the necessary qualities.

8.2.2 Minimum qualifications

Annex 1, section 4.5, specifies the minimum requirements for the issuance of the FOO/FD license. Although Annex 1 does not provide direct guidance on the qualifications required (e.g. educational level) for admittance to the Course for FOO/FDs, experience has shown that successful completion of training generally requires:

— a minimum age of 21 years;
— a functional knowledge of the English language;
— a medical fitness for duty; and
— a minimum educational level of successful completion of high school (11 years of schooling or more).

8.2.3 Types of training

8.2.3.1 Annex 1 mentions various forms of past aviation experience that are adequate for the FOO/FD, and many States select their FOO/FD trainees from personnel who have had such aviation experience. However, other States have found it necessary to train persons who do not

have such previous experience and who must, therefore, be trained from the very beginning and allowed to obtain the necessary experience either during their training or immediately after it. It is obvious that the training requirements of these two groups of trainees will vary.

8.2.3.2 To cover the various backgrounds of trainees, it is recommended that training be divided into two phases as follows:

Phase one consists of basic knowledge. Its completion ensures that a trainee has the necessary background to proceed with phase two of the training. The training syllabus covered in Doc. 7192 D-3, Chapters 3 to 15 needs to be covered during this phase.

Phase two consists of applied practical training and route experience. A training syllabus for this phase is detailed in Doc. 7192 D-3, Chapter 16 and guidance on training duration is provided in Table 1-1.

8.2.3.3 Trainees who do not have previous aviation experience will have to undergo the complete training programme as recommended in phase one. Trainees who have had suitable aviation experience, however; may not need to undertake this complete programme. For example, a professional pilot, a flight navigator or an air traffic controller can be assumed to have, at least, partially completed phase one if they have been actively employed in these occupations within the past few years. In such cases, training institutes or operators, with the approval of the State authorities, are encouraged to apply the necessary flexibility in arranging appropriate training courses, emphasizing subjects of particular concern to FOO/FDs. The same flexibility can also be applied during requalification or recurrent classroom training. Table 1-1 provides an approximate duration for the training of the FOO/FD (phase one). It also contains a shortened training duration to serve as a guideline for the training of experienced personnel and for the requalification of FOO/FDs.

8.2.3.4 In using the curriculum recommended in the chapters mentioned above, local considerations may dictate the advisability of changing the sequence of the subjects.
However, the relative importance accorded to each subject should, as much as possible, remain unchanged. The multiplicity types of aircraft, navigation aids and operational practices throughout the world makes it undesirable to define too rigidly many of the headings of the syllabus, and it is necessary to leave some flexibility to those in charge of the training course. Instructors must, however, ensure that all items in the training manual syllabus are adequately covered and any requirements relevant to individual authorities should be treated as additional subjects and not as substitutions for the syllabus recommended in this manual. Instructors must also ensure that all items required in their State's licensing examination are adequately covered. Any choices in the examination itself should be confined to the additional subjects dealing with those practices and procedures which the trainee is most likely to use in the first period of his duties as an FOO/FD. This choice of additional subjects will very often be made easy by specific requests by operators, and by the type of aircraft used operationally.

Instructors delivering FOO/FD training programmes must have adequate instructional and technical skills and have successfully completed a Trainer Course prior to delivering such a FOO/FD training programme.

8.2.4 Standard of accomplishment

8.2.4.1 Each training objective in this document is described with reference to the establishment of conditions, performance and a standard of accomplishment.

The conditions describe the scenario where trainee performance will be developed and tested while indicating whether actual equipment, mock-ups, or simulators, etc., are to be used. The standard of accomplishment establishes the level of trainee performance that must be attained and may differ from organization to organization depending on the training equipment available.

8.2.4.2 In measuring the standard of accomplishment, the use of only two grades, *pass* and *fail*, is recommended. It must, however, be noted that many training establishments prefer to use a numerical grading system as trainees strive harder and learn more when rewards increase. If the same grade, *pass*, is given for a 99 per cent score as for a 75 per cent score, trainees may not strive for perfection.

8.2.5 Training reference guide

8.2.5.1 Table 1-1 presents the recommended duration (in hours) of the various subjects that need to be covered during phase one training (basic knowledge) for trainees with and without previous aviation experience, and Phase two (applied practical training). In appreciation of the fact that differences in requirements may necessitate changes in the suggested syllabus to allow completion of the course within the period allotted for training, the total hours required for the completion of a subject are given. Instructors should, however, ensure that all sections of the syllabus are adequately covered to the necessary degree in order to meet the desired level of accomplishment before the trainees are assigned to phase two training.

8.2.5.2 In addition, the various parts of the course have been marked with a coding from 1 to 4 indicating an increasing degree of expertise to clarify understanding of the desired level of accomplishment.

1 – denotes a basic knowledge of a subject. Trainees should have a basic understanding of the subject but are not expected to apply that knowledge.
2 – denotes knowledge of the subject and the ability, where applicable, to apply it in practice with the help of reference materials and instructions.
3 – denotes a thorough knowledge of the subject and the ability to apply it with speed and accuracy.
4 – denotes extensive knowledge of the subject and the ability to apply procedures derived from it with judgement appropriate to the circumstances.

Table 1-1

Recommended duration and degree of expertise for phase one and phase two training

PHASE ONE — BASIC KNOWLEDGE

Subject matter	Recommended duration (hours)		Degree of expertise
	Trainees without previous aviation experience	Trainees with previous aviation experience	
Civil air law and regulations	30	18	
Certification of operators			2
The Convention on International Civil Aviation (The Chicago Convention)			2
International air transport issues addressed by the Chicago Convention			2
The International Civil Aviation Organization (ICAO)			2
Responsibility for aircraft airworthiness			3
Regulatory provisions of the flight manual			3
The aircraft minimum equipment list (MEL)			3
The operations manual			3
Aviation indoctrination	12	6	
Regulatory			3
Aviation terminology and terms of reference			3
Theory of flight and flight operations			2
Aircraft propulsion systems			2
Aircraft systems			2
Aircraft mass (weight) and performance	27	15	
Basic principles for flight safety			3
Basic mass (weight) and speed limitations			3
Take-off runway requirements			3
Climb performance requirements			3
Landing runway requirements			3
Buffet boundary speed limitations			3
Navigation	24	12	
Position and distance; time			3
True, magnetic and compass direction; gyro heading reference and grid direction			2
Introduction to chart projections: The gnomonic projection; the Mercator projection; great circles on Mercator charts; other cylindrical projections; Lambert conformal conic projection; the polar stereographic projection			2
ICAO chart requirements			3
Charts used by a typical operator			3
Measurement of airspeeds; track and ground speed			3

Subject matter	Recommended duration (hours)		Degree of expertise
	Trainees without previous aviation experience	Trainees with previous aviation experience	
Use of slide-rules, computers and scientific calculators			3
Measurement of aircraft altitude			3
Point of no return; critical point; general determination of aircraft position			3
Introduction to radio navigation; ground-based radar and direction-finding stations; relative bearings; VOR/DME-type radio navigation; instrument landing systems			2
Navigation procedures			3
ICAO CNS/ATM systems (an overview)			1
Air traffic management	39	21	
Introduction to air traffic management			2
Controlled airspace			3
Flight rules			3
ATC clearance; ATC requirements for flight plans; aircraft reports			3
Flight information service (FIS)			3
Alerting service and search and rescue			3
Communications services (mobile, fixed)			3
Aeronautical information service (AIS)			3
Aerodrome and airport services			3
Meteorology	42	21	
Atmosphere; atmospheric temperature and humidity			2
Atmospheric pressure; pressure-wind relationships			2
Winds near the Earth's surface; wind in the free atmosphere; turbulence			3
Vertical motion in the atmosphere; formation of clouds and precipitation			2
Thunderstorms; aircraft icing			3
Visibility and RVR; volcanic ash			3
Surface observations; upper-air observations; station model			3
Air masses and fronts; frontal depressions			2
Weather at fronts and other parts of the frontal depression; other types of pressure systems			2
General climatology; weather in the tropics			1
Aeronautical meteorological reports; analysis of surface and upper-air charts			3
Prognostic charts; aeronautical forecasts			3
Meteorological service for international air navigation			4
Field trip to local meteorological office			2

Subject matter	Recommended duration (hours)		Degree of expertise
	Trainees without previous aviation experience	Trainees with previous aviation experience	
Mass (weight) and balance control	27	15	
Introduction to mass and balance			3
Load planning			3
Calculation of payload and loadsheet preparation			3
Aircraft balance and longitudinal stability			3
Moments and balance			3
The structural aspects of aircraft loading			3
Dangerous goods and other special cargo			3
Issuing loading instructions			3
Transport of dangerous goods by air	9	9	
Introduction			
Dangerous goods, emergency and abnormal situations			3
Source documents			3
Responsibilities			3
Emergency procedures			3
Flight planning	18	9	
Introduction to flight planning			2
Turbo-jet aircraft cruise control methods			3
Flight planning charts and tables for turbo-jet aircraft			3
Calculation of flight time and minimum fuel for turbo-jet aircraft			3
Route selection			3
Flight planning situations			3
Reclearance			3
The final phases			3
Documents to be carried on flights			3
Flight planning exercises			3
Threats and hijacking			3
ETOPS			2
Flight monitoring	16	16	
Position of aircraft			3
Effects of ATC reroutes			3
Flight equipment failures			3
En-route weather changes			3
Emergency situations			3
Flight monitoring resources			3
Position reports			3
Ground resource availability			3

Subject matter	Recommended duration (hours)		Degree of expertise
	Trainees without previous aviation experience	Trainees with previous aviation experience	
Communications — Radio	18	6	
International aeronautical telecommunications service			2
Elementary radio theory			2
Aeronautical fixed service			2
Aeronautical mobile service			2
Radio navigation service			2
Automated aeronautical service			2
Human Factors	15	15	
The meaning of Human Factors			3
Dispatch resource management (DRM)			4
Awareness			3
Practice and feedback			3
Reinforcement			3
Security (emergencies and abnormal situations)	8	6	
Familiarity			3
Security measures taken by airlines			3
Procedures for handling threats, bomb scares, etc.			3
Emergency due to dangerous goods			3
Hijacking			3
Emergency procedures			3
Personal security for the FOO/FD			3

PHASE TWO — APPLIED PRACTICAL TRAINING

Subject matter	Recommended duration
Applied practical training	
Applied practical flight operations	25 hours
Simulator LOFT observation and synthetic flight training	4 hours
Flight dispatch practices (on-the-job training)	13 weeks
Route familiarization	1 week

9. Accommodation and equipment for classroom-based training

9.1 Classrooms and equipment

9.1.1 Opinions differ on the amount of classroom space required for each trainee. The range of "ideal" space for each adult in a classroom varies from a low of 1.4 m2 to a high of 6.7 m2. The reason for the wide range in "ideal" figures is that classroom designers either envision different classroom environments or account for certain spaces within the classroom, such as aisles and front setback, differently.

9.1.2 The sizes of classrooms are affected by:

— number of trainees in a class

— trainee workstation size

— class configuration

— size of aisles; and

— use of media (in particular, projected media and hands-on projects)

Note. — ICAO recommends that the ratio of trainees per instructor be taken into account when planning the classroom size. In order to provide for sufficient supervision and control, a ratio of one instructor for every 15 trainees and 2 instructors for every 25 trainees is recommended.

9.1.3 The use of media and hands-on experiments is an important factor in determining the amount of common space required in a classroom. The most commonly used visual media are slides, chalk/marker boards, overhead projectors, video tape and easels. The use of projected media (slides, overheads, TV, etc.) has considerable impact on room size and should be taken into consideration when assigning classrooms.

9.1.4 In planning for space requirements for the training of FOO/FDs, training managers must take into consideration the trainee workstations, area required for hands-on training, faculty workstations and storage area.

9.1.5 Trainee workstation space includes the trainee's work surface, any additional equipment (terminal, audio/ visual, etc.), a chair, and the space for chair pushback and maneuverability. The concept of workstation space is important when sizing rooms for classes containing different numbers of trainees. The total area allowed in a classroom for each trainee varies with the size of the class. An adequate work surface within the work space is very important. The large amount of reference material used in the training of FOO/FDs requires considerably larger work surfaces than would be provided by the attached writing surface of an auditorium chair.

9.1.6 Computers can also be considered as useful training aids for FOO/FDs. Used as instructional media, computers usually take the form of desktop micro-computers with keyboard and monitor. They can communicate verbal and graphic information and can accept verbal as well as manual or tactile responses. Computers may be used for drills, computer-managed instruction, testing and simulations. For detailed information about the use of computers as a training tool, training managers are advised to refer to the ICAO TRAINAIR document — Computer Application in Training.

9.2 The learning environment

9.2.1 The key to a good learning environment is the elimination of discomforts and other undesirable characteristics. Ten primary factors have been identified:

— the climate must be comfortable

— lighting must be of adequate level for work or viewing

— distracting sound must be kept to a minimum

— work areas must be aesthetically pleasing

— workstations must be comfortable

— work space must be adequate

— work area must be reasonably clean

— training equipment must be adequate

— visual media must be visible; and

— audio media must be listenable

9.2.2 If any of these factors are unsatisfactory, the result can be distraction from the task at hand, and fatigue can result from the effort required of the trainee to adapt to a poor environment. One of the most widely recognized factors listed is comfort of workstations which includes the comfort of the chair.

9.3 Performance evaluation (tests)

9.3.1 Performance evaluation (tests) is an integral part of the training process. Tests should always be prepared with the sole purpose of measuring whether or not the trainee has achieved the training objective. Trainees must always be informed on how they are going to be evaluated, so they can orient their efforts. The information must include the conditions that will exist during the test, the performance that is expected from the trainees, the standards of accomplishment that have to be met and the consequences of an inadequate performance. It is recommended that errors on knowledge exams and skill tests be reviewed with trainees to reflect corrections to achieve 100 percent. Trainees must be informed of the result of their evaluation and instructors must offer correction of improper responses.

9.3.2 Time and resource constraints may limit the amount of testing that can be given to each objective. However, the criticality of the subject and the performance difficulties which can be encountered should give some indication as to when, how and what performance evaluation should be required. Generally speaking, performance measurement is undertaken to evaluate whether or not courses taught have been understood by the trainees at the desired level:

— Skills are best tested by performance tests (the trainee performs the task described in the objective under real or simulated conditions).

— Knowledge is best tested by oral or written tests.

— Attitudes are tested by observations of performance or by means of questionnaires.

10. CREDITING DISTANCE LEARNING AS A COMPONENT OF TRAINING FOR AIRCRAFT DISPATCHERS.

A. Background. In the so-called Information Age many new information-sharing systems have been developed. Those systems have been centered largely on digital technology involving desktop computers and the Internet. Those systems include modern training products, many of which are being used effectively today in aviation courses conducted by accredited universities and in air carrier training programs approved by the competent authority. Collectively, those products fall under a relatively new heading that has been called distance learning. As the quality of those products continues to improve, the training/learning process stands to benefit even more. Previous guidance seemed to presume that traditional classroom training was inherently superior to other training. Besides the proven effectiveness of modern training products, distance learning affords a low-cost alternative to classroom training, an alternative that is timely and appropriate in today's challenging economic environment. The updated guidance that follows should promote wider implementation of modern training methods apart from the traditional classroom.

B. Applicability. This paragraph applies to aircraft dispatcher training programs subject to BDCA approval. Creditability of hours spent in distance learning activities applies to the programmed hours of training specified in in this AC.

C. Distance Learning. Distance learning is a term currently not used in BDCA regulations. It is a term used in the aviation industry with various meanings depending on context. For the purposes of this advisory circular, distance learning means learning that is accomplished by any training method not including an instructor and a gathering of trainees collocated in a traditional classroom. (Distance learning is known by other terms such as E-learning, home study, self-guided training, virtual classroom, distributed training, computer-based training, WEB-based training, and others).

D. Interim Guidance. Experts continue to develop a systematic approach for using the many effective training methods and products now available. It is unlikely that the last word will be written in the foreseeable future, if ever, since there is apparently no end to the prospects. The guidance contained in this paragraph applies until superseded, and should be used to help implement and standardize distance learning among air operators.

E. Training Objectives and Proficiency. A training objective is a desired performance or behavior demonstrated under certain conditions with respect to specific standards. One way to identify training objectives and to verify that they have been met (also known as validation) is by a three-tier scheme comprising knowledge, skill, and performance.

1) Knowledge- specific information required enabling a student to develop the skills and attitudes to effectively recall facts, identify concepts, apply rules or principles, solve problems, and think creatively. Because knowledge is covert, students must be assigned overt activities to demonstrate their knowledge base.

2) May be validated through written, electronic, or oral testing.

a) Examples: Learning facts by rote, such as an operator's history, organization, and general policies, commit an airplane flight manual's limitations to memory, or to get a basic understanding of an airplane's systems.

3) Skill- an ability enabled by knowledge to perform an activity or action. Skills are often grouped

into cognitive skill and psychomotor skill categories

a) *Cognitive skill*- ability to perform a task requiring the manipulation of words, numbers and symbols which requires the application of knowledge. Usually involves classification, the application of (mental) rules, procedures or principles, the solution of problems or the application of creative thinking.

1. May be validated through written, electronic, or oral testing or through task performance.

2. Examples: Challenging a dispatch trainee to apply knowledge of an airplane's Limitations to a weight and balance computation; or to apply basic systems knowledge to operating aircraft systems, and populating data in the flight planning system.

b) *Psychomotor skill*- ability to perform a task requiring dexterity, coordination and muscular activity which requires the application of knowledge. Usually involves the manipulation of objects or materials and the use of fine and gross muscular movement in a coordinated manner.

1. May be validated through performance of a task.

2. Example: Proper and efficient utilization of performance and flight planning tools to achieve the desired results.

4) Performance- ability to accomplish useful work by combining knowledge, skill, and intangibles such as inference and judgment (sometimes called "soft skills"). Practice and application develop abilities for demonstration.

a) May be validated through performance of related tasks, sometimes called event sets.

b) Example: Demonstrating competence as a dispatcher in any operational situation or simulation involving flight planning, dispatch release, or flight following.

F. Scope of Creditability of Distance Learning. Distance learning credit is appropriate for Knowledge objectives and for Cognitive skill objectives. Creditability of distance learning is more complicated in regard to Psychomotor skills and Performance. Distance learning creditability for psychomotor skills are not authorized by this AC.

G. Limits on Creditability of Distance Learning.

1) The BDCA recognizes the great training potential of distance learning that is well planned and effectively validated. Training developed in accordance with an implementation plan (described below) is subject to BDCA approval. In the past, credit for Distance Learning for flight dispatch training was limited to Recurrent and Requalification training and there were limits to the number of program hours that could be initially credited. Initially, distance learning may now be as much as 50% creditable toward the Knowledge and Cognitive Skill training objectives in all ground training, including the following training categories:

i. Basic Indoctrination
ii. Initial and Transition Ground Training
iii. Dispatch Emergency Training
iv. Recurrent
v. Requalification

2) Applicants for distance learning must be able to show, for those categories chosen, that

distance learning methods are at least as effective as instructor led, traditional classroom training, relative to knowledge and cognitive skill training objectives. Dispatch applications, Supervised Operating Experience, Area Qualification, and practice would be excluded from distance learning. Dispatch Resource Management (DRM) is considered a dispatch application. Due to the critical nature and safety implications of these categories, they are initially excluded from distance learning. Consideration for some distance learning in these categories is possible, based on the quality of that distance learning.

H. Training Media. The general nature and specific characteristics of training media used for distance learning vary widely. Examples include paper media, videotape, CBT, CDs, Web-based training, and virtual classroom. The media used should meet the requirements of the respective training objective. Validation of training effectiveness is one of the most important components of the implementation plan described below.

I. Implementation Plan. Any proposal for ground training to be accomplished by distance learning should include a plan for start-up, validation, operation, and maintenance of that training. This plan should include at least the following elements:

1) Start-up. Identification of knowledge and cognitive skill areas, and specific training objectives

a) Training objectives can be reduced to simple terms such as being able

i. to recall
ii. to recognize
iii. to comprehend
iv. to apply

1. Identification of the media to be used for training and testing.

2. A validation strategy addresses (1) the effectiveness of the training itself, and (2) the learning accomplished by each person trained. Key features of a validation strategy are shown below.

b) Effectiveness of the ground training being conducted

· *Setting a reference.* One validation method is to establish a performance baseline from which to measure the effectiveness of the training proposed. Baselines exist in most on-going air carrier training programs. Examples of performance baselines include average training hours a trainee spends in learning a certain subject, average pass-fail rates for tests of training content, median scores, average pass-fail rates for proficiency checks, and many others. A performance baseline may be set by using an existing baseline or by referring to some other existing standard.

· *Maintaining currency.* Validation depends upon maintaining the currency of the training to be conducted. A reliable method to do so is an essential part of a training proposal.

· *Tracking.* A method for keeping test results and tracking overall performance

c) Learning accomplished by each person trained

· *A strategy for testing*. Testing should be designed to determine that training objectives are being met by each trainee.

· *Integrity of tests.* A method should be developed to ensure integrity of tests, including integrity of

test questions and test answers, and controlled access to tests and test results

· *Tracking.* A method for keeping test results and tracking each individual's performance

2) Validation. Validation of training is a determination that the training proposed actually succeeds in meeting the performance objectives for that training. Two essential assessments comprise validation of training.

a) *Knowledge Validation.* Assessment of a student's technical knowledge, accomplished by written or oral test.

b) *Cognitive Skill Validation*. Assessment of an individual's practical application of knowledge, which may be accomplished by written or oral test or by a more subjective evaluation by a flight dispatch instructor.

3) Passing Grade – 80 %. The dispatcher should satisfactorily accomplish the knowledge test (oral, written, or computer based), minimum passing score should be 80%. Any incorrect test answers should be addressed at the time of the test, and should be corrected to 100%. A score less than 80% would require retraining in all substandard areas, retesting before entry, and continuance of training in practice, application, and demonstration.

4) Integrity of test questions depends on several factors.

a) Scope. A test for an initial trainee should include at least one question for each element contained in each training module. Ground training and testing for trainees in other curriculum segments such as recurrent may be less comprehensive, but should cover significant and timely subjects, particularly new material and changes since one's previous recurrent ground training.

NOTE: An element is a subgroup of related content within a training module. It is the fourth level of curriculum detail—curriculum, curriculum segment, training module, element. For example: Weather is one training module; domestic weather reports, international weather reports, and the use of actual and prognostic weather charts are elements.

b) Library. A library of questions should be developed that thoroughly cover the training objectives.

c) Multiple Questions. Where possible, multiple questions should be developed for each training objective.

d) Uniqueness. Tests should be generated by random selection of questions from the library, so that no two tests are alike.

e) Currency. Test questions should be reviewed as often as necessary to assure their relevancy, and to incorporate new or changed material

J. Integrity of Test Answers. Trainers should develop measures by which the identity of a person taking the test may be confirmed, and printed or electronic test answers may not be reproduced and distributed among trainees so as to beat the test.

K. Operations and Maintenance. It includes quality control procedures for the collection, protection, and analysis of data for tracking training effectiveness. Also, a strategy for equipment upgrade, program adjustments driven by data, and feedback from trainers and trainees.

1) A description of the overall training process, its attributes, and mechanism for improvement, using validation tools would be required for approval. Acceptable attributes would include responsibility, process, controls, measurement, improvement process, and any interface.

2) Qualification as an aircraft dispatcher requires knowledge. Because of the critical nature of that knowledge an effective training program requires practice, application, and demonstration of that knowledge. Knowledge can be taught through Distance Learning. Initially, practice, application, and demonstration must occur in a classroom, instructor led environment, accomplished by a physical/ verbal practice of skills that encourages interaction among participants for the specific area of knowledge.

3) Distance Learning (DL) can be incorporated in new and existing training programs.

4) Up to a 50% DL and 50% classroom, instructor led training program may be initially approved, in each of the pertinent training categories (Initial New-Hire Training, Transition Training, Recurrent Training, and Requalification Training) based on the merits of the proposed program. The 50% DL may be increased in any pertinent training category based on the sophistication and innovation of the DL.

5) Incorporation of process in the approved training program will place the 50/50 (more or less) where it needs to be, based on performance.

L. Interactivity. Training developers should provide for interactivity between trainees and instructors, and between the trainees themselves.

· *When in the field.* In particular, a trainee should have ready access to an authorized ground instructor on weekdays during normal business hours to resolve questions encountered during distance learning and pertinent testing.

· *When at a centralized training location.* Before any phase of training that incorporates practice, application, and demonstration, trainees should be convened in a proctored classroom setting with an instructor to resolve any remaining issues arising during distance learning. This interactivity is particularly beneficial in respect to standardization of trainees in initial new-hire and initial equipment curricula.