Doc 7192-AN/857
Part E-1

training manual

Part E-1
CABIN ATTENDANTS' SAFETY TRAINING

SECOND EDITION — 1996

Approved by the Secretary General
and published under his authority

INTERNATIONAL CIVIL AVIATION ORGANIZATION

FOREWORD

Cabin attendants are required on board aircraft to ensure passenger safety. The effectiveness of cabin attendants in fulfilling their safety-related duties can only be attained through proper and effective training. Although the requirements of States and the procedures adopted to satisfy those requirements show considerable variation, there has been a growing interest among States in the standardization of the basic training and further qualification of cabin attendants in the technical aspects of aircraft equipment which cabin attendants may be required to operate in the normal safety procedures and the procedures to be followed during emergencies.

In line with Annex 6 — *Operation of Aircraft, Part I, International Commercial Air Transport — Aeroplanes* specifications, the term *cabin attendant* is used throughout this manual to identify crew members required on board an aircraft to effect a safe and expeditious evacuation of the aeroplane and to perform the necessary functions in an emergency or in a situation requiring emergency evacuation. For all practical purposes, *cabin attendant* is synonymous with the terms *cabin crew* and *flight attendant* commonly used in the industry to identify personnel carried on board an aircraft in accordance with the requirements of Chapter 12 of Annex 6 to the Convention on International Civil Aviation. The manual fully recognizes cabin attendants' place as members of an over-all crew with an integrated approach of ensuring flight safety. This recognition is appropriately emphasized in the manual's recommendation for joint flight crew and cabin crew emergency training and in the chapter on Human Factors and crew resource management (CRM) training for all crew members.

Cabin attendants' training is about safety. Their duties and responsibilities in air transport operation are safety-related and their training should clearly reflect this fact. There is reason to believe that, in many places, cabin attendants may not have been given enough information about and/or practice with equipment and situations to master the skills they need in an emergency. A special investigation, conducted by the National Transportation Safety Board (USA), on cabin attendant's training and performance during emergency situations revealed that some cabin attendants did not demonstrate proficiency in their knowledge of exit operations, evacuation slide or slide/raft inflation and disconnection, location of equipment, knowledge of chemically generated oxygen systems, use of checklists during an emergency, crew communication and ability to follow established or standard operating procedures.[1]

Training may never duplicate all the types of situations that may confront cabin attendants in the performance of their duties on board an aircraft. Nevertheless, training can instill the basic knowledge, skills, attitudes and confidence that will allow cabin attendants to handle emergency situations. As the structural strength of transport-category aeroplanes improves and accidents become more survivable, cabin attendants are assuming a more critical role for ensuring passenger safety. Cabin attendants are an important part of the operational safety system, both in the prevention of accidents and in the assistance they give to survivors in the event of an accident. Because of these changes, civil aviation authorities should ensure that operators implement a training system for cabin attendants which consistently results in no less than a minimum level of proficiency so that cabin attendants can perform their duties and undertake their responsibilities in the most efficient and effective manner.

This manual contains training syllabuses for the training of cabin attendants covering both initial and recurrent phases. Subject matter required to be addressed during initial, recurrent and aircraft type training is indicated in 1.2.5 — *Training reference guide* which also includes the desired degree of expertise required in each subject. Details of training included in this manual are not all-inclusive and are provided as a guideline to the minimum requirement for the training of cabin attendants. The training syllabus of cabin attendants assigned for duties on commercial international air transport operations must include syllabuses suggested in this manual but should not be limited by it.

This manual has been prepared by the Personnel Licensing and Training Section of ICAO and replaces ICAO *Doc 7192 — Training Manual, Part E-1 — Cabin Personnel, First Edition, 1976.* ICAO would like to acknowledge the contribution received from States, international organizations and individual experts who have provided support, advice and input for this manual. Transport Canada, Aviation — *Flight Attendant Training Standard,* Original Issue, 1994, was also very useful in the preparation of this manual.

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DEFINITIONS

Able-bodied passengers. Passengers selected by crew members to assist in managing emergency situations if and as required. Non-able-bodied passengers should be removed from exit rows prior to flight. In a planned emergency, able-bodied passengers will be briefed on their responsibilities if time permits.

Barostatic. An atmospheric pressure, used in forecasting the weather and determining altitude, derived using a barometer.

Cabin attendant.[1] A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.[2]

Cognitive. Pertaining to cognition. Knowing, perceiving, or conceiving as an act or faculty distinct from emotion and volution.

Colicky pain. Denoting or resembling the pain of colic: pain relating to the colon. Spasmodic pains in the abdomen caused by spasm, obstruction or twisting.

Convention (the). The Convention on International Civil Aviation (ICAO Doc 7300) signed at Chicago on 7 December 1944.

Crew member.[1] A person assigned by an operator to duty on an aircraft during flight time.

Critical phases of flight. The period of high workload on the flight deck, normally being the periods between the beginning of taxiing until the aircraft is on the route climb phase and between the final part of descent to aircraft parking.

Dangerous goods.[1] Articles or substances which are capable of posing significant risk to health, safety or property when transported by air.

Emergency locator transmitter (ELT).[1] A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may either sense a crash and operate automatically or be manually activated. An ELT may be any of the following:

Automatic fixed ELT: An ELT which is permanently attached to the aircraft.

Automatic portable ELT: An ELT which is rigidly attached to an aircraft but readily removable from the aircraft after a crash.

Automatically deployable ELT: An ELT which is rigidly attached to an aircraft and deployed automatically in response to a crash. Manual deployment is also provided.

Survival ELT: An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency and activated by survivors. Automatic activation may apply.

Exanthematous diseases. Relating to an exanthema: a skin eruption occurring as a symptom of an acute viral or coccal disease, as in scarlet fever or measles.

Flight crew member.[1] A licensed crew member charged with duties essential to the operation of an aircraft during flight time.

Hypoglycaemic attack. Pertaining to or characterized by hypoglycaemia: abnormal decrease in concentration of glucose in the circulating blood, e.g. less than the minimum of the normal range.

Hypothermia. A subnormal body temperature significantly below 37°C.

Hypoxia. A deficiency of oxygen in inspired gases, arterial blood or tissue, short of anoxia (almost complete absence of oxygen).

Minimum equipment list.[1] A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the master minimum equipment list (MMEL).

Mock-up. A training device that is a partial, functional replica of an actual aircraft, without motion.

Pilot-in-command.[1] The pilot responsible for the operation and safety of the aircraft during flight time.

Prophylaxis. Prevention of disease or injury or a process which can lead to disease or injury.

Protective breathing equipment (PBE). Breathing equipment providing full, sealed protection against smoke, fumes, etc., covering the head, the collar and upper shoulder area. Fifteen-minutes minimum oxygen supply per PBE is recommended.

Simulator.[1] An apparatus which provides an accurate representation of the flight deck and/or cabin of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc., aircraft systems control functions, the normal environment of flight crew members and/or cabin attendants and the performance and characteristics of that type of aircraft are realistically simulated.

Sterile flight deck. During critical phases of flight and all flight operations (except cruise) conducted below 10 000 feet, no crew member may engage in any activity or conversation that is not required for safe operation of the aircraft. Non-essential cockpit-cabin communication is prohibited during this period.

1. This term has an official ICAO definition specified in the Annexes to the Convention on International Civil Aviation.

CHAPTER 1. TRAINING PRINCIPLES

1.1 Regulatory requirements

1.1.1 The assignment of cabin attendants for safety-related duties on board an aircraft is a legal requirement of Annex 6 to the Convention on International Civil Aviation. Paragraph 12.1 of Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes*, obliges operators to establish, to the satisfaction of the State authorities, the minimum number of cabin attendants required for each type of aeroplane they operate in order to effect a safe and expeditious evacuation of the aeroplane, and the necessary functions to be performed in an emergency or a situation requiring an emergency evacuation.

1.1.2 Paragraph 12.4 — *Training*, of Annex 6 requires that:

An operator shall establish and maintain a training programme, approved by the State of the Operator, to be completed by all persons before being assigned as a cabin attendant. Cabin attendants shall complete a recurrent training programme annually. These training programmes shall ensure that each person is:

a) competent to execute those safety duties and functions which the cabin attendant is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation;

b) drilled and capable in the use of emergency and life saving equipment required to be carried, such as life-jackets, life-rafts, slide-rafts, emergency exits, portable fire extinguishers, oxygen equipment and first-aid kits;

c) when serving on aeroplanes operated above 3 000 m (10 000 ft), knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized aeroplanes, as regards physiological phenomena accompanying a loss of pressurization;

d) aware of other crew members' assignments and functions in the event of an emergency so far as is necessary for the fulfilment of the cabin attendant's own duties; and

e) aware of the types of dangerous goods which may, or may not, be carried in a passenger cabin and has completed the dangerous goods training programme required by Annex 18.

1.1.3 Annex 18 — *The Safe Transport of Dangerous Goods by Air* (Chapter 10) requires that dangerous goods training programmes are established and updated as provided for in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284). In detailing the subject matter relating to dangerous goods transport with which crew members (other than flight crew members) should be familiar, the Technical Instructions (Part 6, Chapter 2) requires that, as a minimum, cabin attendants should be familiar with the general philosophy, prohibited dangerous goods, exceptions for passengers, general label identification and emergency procedures.

1.1.4 The successful application of regulations con-cerning 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 concerned in aircraft operation. Cabin attendants play a significant role in the safe operation of an aircraft and international regulations require that they are appropriately trained.

1.2 Training requirements

1.2.1 Principal duties

1.2.1.1 Cabin attendants are unique among airline personnel because they essentially have two distinct responsibilities on board an aircraft. The most important, but least visible, responsibility of cabin attendants is that which concerns the safety of passengers and the aircraft cabin. This is a major responsibility and requires that they undergo specialized and thorough training not only to gain a sound knowledge of their safety-related responsibilities but also to instill in them complete confidence and provide them with the authority needed in performing their duties.

1.2.1.2 The second and most visible duty of cabin attendants is the role they play as their airline's public relations officers,

attending to passengers' needs and, in general, creating a favourable impression of their airline through friendly and efficient service. In fact, airlines' selection criteria and sales and promotion advertisements tend to emphasize the customer satisfaction side of the job to an extent that the safety-related responsibility of cabin attendants seems to be overshadowed.

1.2.1.3 Regardless of the operators' emphasis on duties and responsibilities of cabin attendants, from the regulatory point of view, the major function of cabin attendants on board an aircraft is to ensure passenger safety by preventing and managing adverse situations which may develop in the aircraft cabin and to provide guidance to all persons on board during an emergency.

1.2.1.4 The fact that cabin attendants exercise their passenger-service-related duty during every flight may have created an impression that their safety-related role is secondary to the marketing demands imposed both by the airline management and the travelling public. This assumption, coupled with the fact that cabin attendants rarely experience an emergency situation requiring the use of their safety-related training, could affect their mental preparedness to handle sudden emergency situations. Any in-flight emergency will require cabin attendants to immediately transform themselves from amiable and ready-to-please airline public relations employees into assertive leaders, responsible for the safety of every person on board the aircraft.

1.2.1.5 Leadership function and deciding priorities of actions to be taken are two of the main responsibilities of cabin attendants in an emergency. These are functions which require training in leadership and decision making. Cabin attendants' training in these subjects should emphasize their leadership role in aircraft cabins in an emergency. Their training should be designed to underline their full responsibility for safety and emergency duties in the aircraft cabin and encourage them to undertake this responsibility to the maximum extent possible in their part of the aircraft. Each cabin attendant on a multi-cabin attendant aircraft must also be trained to be able to assume the duties of any station within the cabin, not just the duties of the position presently assigned. If other cabin attendants become incapacitated, the remaining cabin attendant must be prepared to assume responsibility. While service-related duties may be limited to a particular part of a large cabin, knowledge of emergency equipment and procedures must be cabin-wide. Such training is not meant to undermine the over-all responsibility of the pilot-in-command for the safety of the aircraft; its purpose is to augment the efforts of the flight crew and ensure total safety by training cabin attendants to contribute effectively to the over-all safety of the flight. Joint safety and emergency training for both flight crew and cabin attendants can develop confidence in each other's capabilities as communication and co-ordination will be enhanced and there will be knowledge that all crew members are doing their share to ensure the safety of the flight.

1.2.2 Minimum qualifications

1.2.2.1 At present, there are no international standards for the qualifications of cabin attendants. However, the major function of cabin attendants as crew members responsible for the safety and well-being of passengers in the aircraft cabin make it essential that a minimum standard of medical standard, knowledge, age and other qualifications are met.

1.2.2.2 Specification of minimum standards helps ensure that individuals selected will be capable of mastering the training programme and will be able to perform the required safety and emergency duties. Without such minimum standards, cabin attendants may not be able to develop the authority or self-confidence to lead an evacuation or manage other cabin emergencies. Cabin attendants must be able to read and understand written instructions, exercise good judgement and communicate effectively to flight crew members, fellow cabin attendants and passengers in an emergency.

1.2.2.3 The following requirements, applicable to cabin attendants, are indicative of the minimum qualifications recommended:

Education: High school (10 years of schooling or more) or an equivalent degree;

Age: Minimum age of 18 years;

Height: Able to reach safety equipment and open and close overhead bins in the aircraft from a standing position;

Weight: Able to:

- move comfortably down the aisle, single file, facing forward;
- pass quickly through the smallest secondary cabin emergency exit window;

Eyesight: Correct vision to appropriate standard (20/40, 60/120, 0.5 recommended);

Medical: Examination to determine physical fitness for safety-related cabin crew responsibilities.

1.2.3 Types of training

1.2.3.1 Basically, regulatory provisions require that cabin attendants annually complete the training programme established by the operator. They also require cabin attendants to be knowledgeable about the location and operation of safety and emergency equipment for each type of aircraft on which they operate and to be trained to deal with both normal and emergency safety situations including relevant communication and crew co-ordination procedures.

1.2.3.2 *Initial training* is required for persons who have not been previously employed by the airline as cabin attendants. To be effective, initial training should be rapidly complemented by line indoctrination. Initial training shall ensure that each trainee acquires the knowledge necessary to fulfil the responsibilities and duties assigned to cabin attendants in the interest of safety. This will be primarily accomplished through classroom instruction complemented by a series of drills, exercises and hands-on training on safety and emergency procedures designed to provide trainees with the skills necessary to perform their duties. The Operator must establish minimum time of line indoctrination, approved by the State of the Operator, for each aircraft in its fleet. Each trainee must complete at least one check ride of sufficient duration to permit the trainee to perform, and be checked on, all pre-flight, in-flight, pre-landing and post-landing duties. Additional training and checking may be performed on simulators, depending on the technical capabilities of the device; for example, exercises involving emergency lights, operable galley equipment, smoke or other technical capabilities may be performed on a simulator capable of producing the appropriate environment.

1.2.3.3 Line indoctrination should be accomplished with an acceptable student-to-instructor ratio; ideally one student to one instructor up to a maximum of four to one. If there is more than one student per instructor, safeguards must be in place to assure proper supervision, training and evaluation by the instructor. Indoctrination must have taken place before a cabin crew member performs duties as a required crew member. Cabin attendants on line indoctrination are on board the aircraft for training purposes and must not be considered as part of the required minimum number of cabin attendants for the flight. Some States and airlines are requiring that line indoctrination be initiated within 30 days of fulfilling the requirements of the ground training portion of the operator’s approved training programme.

1.2.3.4 *Recurrent training* is required by regulatory provisions to be performed each twelve-month period following initial or previous recurrent training. It is primarily provided to ensure the maintenance of knowledge and skills through a series of drills, exercises, quizzes, etc. and to familiarize crew members with new procedures and/or equipment introduced since their last training. Cabin attendants rarely get the opportunity to practice most of the skills which have been learned during initial training and are needed in an emergency. Like many skills which require periodic exercise, these skills are perishable. And since high stress levels or panic will degrade previously learned skills, rehearsal and continuing training is essential. Recurrent training ensures the maintenance of such skills and their effective application as required.

1.2.3.5 *Aircraft type training* is required in order to qualify and maintain qualification on each type of aircraft to which the crew member will be assigned to duty.

1.2.4 Standard of accomplishment

1.2.4.1 Each training objective in this manual is described with a basic reference for 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 which must be attained. Standard of accomplishment may differ from school to school depending on training equipment available.

1.2.4.2 In measuring 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 students strive harder and learn more when rewards increase. If the same grade, *pass*, for a 99 per cent score is given as for 75 per cent score, students may not strive for perfection. In all cases, test results should only be used as diagnostic tools to help the instructor and trainees take remedial steps to assure mastery of the subject.

1.2.5 Training reference guide

1.2.5.1 Table 1-1 presents a reference guide to the subject matter to be completed during initial, recurrent and aircraft type training and the desired level of accomplishment to be achieved during initial training. Differences in types of aircraft, operational methods and, possibly, other training activities of the training school may necessitate changes in the syllabus suggested to allow for

completion of the course within the period allotted for training. Instructors should, however, ensure that *all sections* of the syllabus are adequately covered to the degree necessary to meet the desired level of accomplishment before the students are assigned to line indoctrination.

1.2.5.2 To clarify understanding of the desired level of accomplishment required, the various parts of the course, as applicable, have been marked with a coding from 1 to 4 indicating an increasing degree of expertise:

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.

Y Denotes subject matter that must be covered during the specific training phase.

y Denotes subject matter that may need to be covered during recurrent or type training phases as a result of new equipment or newly introduced procedures.

Table 1-1. Training reference guide

Subject matter	*Initial training*	*Recurrent training*	*A/C type training*	*Degree of expertise*
Chapter 3 — Aviation indoctrination				
a) Regulatory aspects				
— National and International	Y	y		2
— Company-specific	Y	y	y	3
b) Aviation terminology and terms of reference				
— Terminology	Y	Y		2
— Terms of reference	Y	y		3
c) Theory of flight and aircraft operations				
— Theory of flight	Y			2
— Major aircraft components	Y		Y	1
— Critical surfaces (contamination of)	Y	Y	y	3
— Pressurization system	Y		Y	2
— Weight and balance	Y		Y	1
— Meteorology/turbulence	Y	y		1
— Communications equipment	Y	y	y	2
— Air traffic control	Y			1
d) Physiology of flight				
— Oxygen system and use	Y	Y	Y	4
— Effects of altitude	Y	Y		4
— Cabin poisoning	Y	Y		4
Chapter 4 — Duties and responsibilities				
— General responsibilities	Y	Y		4
— Pre-flight and post-flight	Y	Y	Y	4
— In-flight	Y	Y	Y	4
Chapter 5 — Emergency procedures				
— General emergency procedures and basic principles	Y	Y	y	4
— Emergency equipment	Y	Y	y	4
— Fire fighting	Y	Y		4
— Smoke removal procedures	Y	Y	y	4
— Emergency lighting systems	Y	Y	Y	4
— Decompression slow/rapid	Y	Y	y	4
— Emergency landing preparations	Y	Y	y	4
— Evacuation procedures	Y	Y	y	4
— Unwarranted evacuations water ditching	Y	Y		4
— Life- and slide-rafts (use of)	Y	Y		4
— Unlawful interference	Y	Y	y	4
Chapter 6 — Carriage of dangerous goods				
— General philosophy	Y	Y		4
— Prohibited goods	Y	Y		4
— Label identification	Y	Y		4
— Exceptions	Y	Y		4
— Emergency procedures	Y	Y		4
Chapter 7 — Human Factors				
— Fundamental Human Factors concepts	Y	y		2
— Crew resource management (CRM)	Y	Y		4

Chapter 8 — Hygiene, aviation medicine and first aid					
—	Terminology	Y	y		2
—	Personal hygiene	Y	y		4
—	Tropical hygiene	Y	y		2
—	Transmissible diseases	Y	y		4
—	Quarantinable diseases	Y	y		4
—	Endemic diseases	Y	y		4
—	Food poisoning	Y	y		4
—	In-flight medical emergencies and incidents	Y	y		4
—	Artificial respiration	Y	Y		4
—	Effects of drugs/intoxicants	Y	Y		4
—	First-aid medical supplies				
	• first-aid kits (contents and use of)	Y	Y		4
	• medical kits (contents and use of)	Y	Y		4

CHAPTER 2. GENERAL RECOMMENDATIONS

2.1 Accommodation and equipment for classroom-based training

2.1.1 General

2.1.1.1 The ICAO *Training Management Guideline* (TMG), developed by the ICAO TRAINAIR Programme, provides detailed information on training support functions, training delivery, administrative support functions, planning and design of training facilities, etc. Another manual, the *Training Development Guideline* (TDG), details development methodologies of training courses for aviation personnel and provides guidelines on training techniques, validation, revision and implementation of course ware, design of tests, post-training evaluation, etc. Although the majority of the material included in both manuals may not directly be applied to the training of cabin attendants, the aim of both the TMG and TDG is to provide civil aviation training managers with the tools they need to effectively manage their training organizations and the providers of cabin crew training can effectively benefit from utilizing those tools. Both the TMG and TDG contain detailed information on the issues discussed in this Chapter.

2.1.2 Classrooms and equipment

2.1.2.1 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 m^2 to a high of 6.7 m^2. The reason for the wide range in “ideal” figures is that classroom designers envision different classroom environments, or account for certain spaces within the classroom, such as aisles and front setback, differently.

2.1.2.2 The sizes of classrooms are affected by:

— number of trainees in a class;
— trainee work station size;
— class configuration;
— size of aisles;
— use of media (in particular, projected media and hands-on projects).

Note.— ICAO recommends that classroom sizes also address the ratio of trainees per instructor. In order to provide for sufficient supervision and control a ratio of 15 trainees for one instructor and 25 trainees for 2 instructors is recommended.

2.1.2.3 The uses of media and hands-on experiments are important factors 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.

2.1.2.4 In planning for space requirements for the training of cabin attendants, training managers must take into consideration the trainee work stations, area required for hands-on training, faculty work stations and storage area.

2.1.2.5 Trainee work station space includes the space required to house the trainee’s work surface, any additional equipment (terminal, audio/visual, etc.) the chair, the space for chair pushback and manoeuvrability. The concept of work station 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 materials used in the training of cabin attendants requires considerably more work surface than would be provided by the attached writing surface of an auditorium chair.

2.1.2.6 Ideally, another classroom should be made available to serve as an emergency and survival procedure lecture room. It should be furnished with a display of all pieces of emergency equipment used on the company’s aircraft, such as the types of portable fire extinguishers, portable oxygen equipment, protective breathing equipment (PBE), life-raft, adult and infant life-jackets, baby survival cots, child restraint systems, contents of the emergency pack, first-aid kits and the

emergency radio. A supply of emergency procedure drill cards should also be available for reference. It is useful to have enlarged samples of emergency procedure drill cards on permanent display on walls, as well as aircraft diagrams pinpointing the location of each piece of emergency equipment.

2.1.2.7 Real equipment would be the medium of choice where the operation of the equipment must be well practised and free of error, for safety and/or operational reasons. This might prove impossible as aircraft are needed on the line and may not be available for training purposes for the time required. However, non-serviceable equipment removed from actual day-to-day service can often be used as training models. Simulators, capable of simulating realistic emergency situations, are today widely available and used to provide effective training of safety and emergency procedures.

2.1.2.8 For training to be effective, it is essential to have at least one realistic life-size *mock-up* of the aircraft fuselage, including the galley and the cabin with a layout of equipment, switch panels, exit and window arrangements, communications systems, fire extinguishers, chutes, etc., to enable realistic simulation of cabin attendants' duties without continuous need for use of actual aircraft. The mock-up should include parts of the cabin containing washrooms, galleys, each type of door and emergency exit used in the aircraft, some seat rows and overhead bins. In all cases, the kind of dials, handles, restraint brackets and switches to be operated should be identical to those found on the aircraft. The force required for their operation should also be the same as that required for operating the corresponding aircraft part and the weight of emergency exit panels should conform to those of the actual aircraft. Emergency equipment should, as much as possible, be stowed in the same location and secured with the same brackets or mounting devices as in the actual aircraft and where they are easily accessible from cabin crew stations.

2.1.2.9 If special training mock-ups or equipment are not readily available, practical training and hands-on drills must be performed on board actual aircraft and a programme to accommodate such training must be arranged. A change in normal class-time or a change in training location may be necessary. Lack of equipment or the inconvenience of getting access to an aircraft must never be allowed as an excuse for the showing of videos, films, etc., and/or classroom theoretical explanations to replace actual hands-on practical training.

2.1.2.10 Computers can also be considered as useful training aids for cabin attendants. Used as an instructional media, computers usually take the form of desk-top microcomputers with keyboard and monitor. They can communicate verbal and graphic information and can accept verbal responses 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.*

2.1.3 The learning environment

2.1.3.1 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;
- — work stations 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.

2.1.3.2 If any of these factors are unsatisfactory, the result can be distraction from the task at hand and fatigue can result from the efforts required of the trainee to adapt to poor environment. One of the most widely recognized factors listed is that of the comfort of work stations which includes the comfort of the chair. As the old saying in training states, the mind will absorb only as long as the seat endures.

2.1.4 Performance evaluation (tests)

2.1.4.1 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 to be present 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 per cent. Trainees must be informed of the result of their evaluation and instructors must offer correction of improper responses.

2.1.4.2 Time and resource constraints may limit the amount of testing that can be given for 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.

2.1.4.3 Performance tests, in some of the emergency-related activities of cabin attendants, are time consuming and are sometimes difficult to arrange because of the complexity of simulating emergency situations. However, considering the importance attached to cabin attendants' responsibility in emergency situations, and the fact that it is only during training that the majority of cabin attendants exercise most of their emergency-related activities, individual, as well as collective skill in managing emergency situations must be tested.

2.1.4.4 During performance tests, the instructor must observe each student individually to ensure that every step is properly accomplished. If an instructor is assigned to watch more than one student during a drill, mistakes may be left uncorrected if they are missed by the instructor.

CHAPTER 3. AVIATION INDOCTRINATION

3.1 Introduction

3.1.1 Cabin attendants' training should, in addition to those subjects which directly concern cabin crew performance, include knowledge in other aspects of aviation operations. This consideration will provide the trainees with a more complete comprehension of their working environment.

3.1.2 Aviation indoctrination is intended to enable cabin attendants to identify relevant international and national regulatory bodies and other aviation organizations, appreciate their role in the operational safety system of the industry and how they relate to the responsibilities vested on the cabin attendant. Under this general subject, cabin attendants are expected to learn commonly used aviation terminologies and be able to apply them in the appropriate context as required. They will learn to identify major aircraft components, including the primary function of the particular components, and be able to report any abnormality they may observe in connection with those components. Cabin attendants will also be introduced to the theory of flight and the physiology of flight which should enable them to acquire knowledge in the principles of flight and to identify common physiological effects of flight.

3.1.3 This training is designed to enable cabin attendants to identify malfunctioning aircraft components and other abnormal situations which must be communicated to the flight crew using correct aeronautical terminology. Numerous accident investigation reports have found that lack of cabin attendant knowledge about the proper name, position, role or use of aircraft components contributed to serious procedural flaws, which delayed evacuations or prevented use of certain exits. The cabin attendant shall be able to communicate observations in an appropriate and clear way using correct terms and phrases and shall also be able to compose a clear, easily understandable written report of observed deficiencies.

3.1.4 Knowledge gained by cabin attendants in these subjects constitutes an important part of an aircraft operation and will permit a more comprehensive operational understanding, develop better situational awareness and improve inter-crew communication thus improving the over-all safety of aircraft operation. Nevertheless, it must be realized that the knowledge imparted in most of the items presented is basic and not meant to produce experts on the subjects. However, their value as an introduction to the aircraft operation environment and their capacity to promote a measure of integration with the flight crew members and other personnel in the industry cannot be overstated.

3.2 Regulatory aspects

3.2.1 Training objectives

Conditions: Given pertinent regulatory documents and a description of a situation related to crew members.

Performance: The trainees will be able to identify the role of international and national aviation regulatory bodies, identify the importance of applicable regulations and be able to describe and apply legislation relating to crew members in general and cabin attendants in particular.

Standard of accomplishment:
The legislation applicable to the described case will be thoroughly identified and its provisions and practical applications understood.

3.2.2 Required knowledge, skill and attitude

- Objectives of and roles played by the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) and other relevant aviation organizations;

- objectives of and roles played by national civil aviation regulatory bodies (e.g. civil aviation authorities, airport authorities, etc.) and of other aviation regulatory bodies (e.g. customs, immigration, health, security) that crew members may be in contact with; air operator certificate (AOC) conditions and limitations;

- the airline's organizational structure, administrative requirements relating to cabin attendants, organ-izational links between cabin attendants and flight crew members;

- specific State and company regulations applicable to all crew members in general and cabin attendants in particular.

3.3 Aviation terminology and terms of reference

Note.— To emphasize working relationship and enhance communication between flight crew and cabin attendants, it is recommended that the following subjects be delivered by personnel from the flight operations department.

3.3.1 Training objectives

Conditions: Given short descriptions of aircraft/air transport operation.

Performance: Cabin attendants will be able to define aviation terms common in air transport operation, identify relevant terms of reference common in aircraft operation and be able to apply them in the appropriate context.

Standard of accomplishment:
For safety-related items and for items of daily routine use, a 100 per cent correct response is required. For other items, a different standard may be established.

3.3.2 Required knowledge, skills and attitude

- Identify terms common in air transport operation and be able to apply them in the appropriate context;

- importance to flight safety of using correct terminology (use factual examples from accident/incident reports, ASRS, CHIRP, CASRP, CAIR, etc., if available);

- standard measurement units used in aircraft operation; the twenty-four-hour clock, changes of time with longitude, the meaning of Co-ordinated Universal Time (UTC), time zones, etc., and their application to aviation;

- the correct application of the phonetic alphabet in aviation-related communication; examples of mis-understandings which may arise from improper use and its effect on flight safety;

- comprehension of the term minimum equipment list (MEL) and cabin items which are included in the list; cabin crew procedures for reporting, removing and repairing all unserviceable items.

3.4 Theory of flight and flight operations

3.4.1 Training objectives

Conditions: Using realistic models, photographs or drawings of aircraft, or during a tour of an actual aircraft.

Performance: Cabin attendants shall be able to identify and describe the basic components of an aircraft, their use, operation and effect of those components on flight and cabin conditions; the theory of flight and the basic environment relating to aircraft operations.

Standard of accomplishment:
Basic components must be correctly associated to basic use and operation. Safety-related items like

critical surfaces, ice formation, surface contamination, etc., must be 100 per cent correct.

3.4.2 Required knowledge, skills and attitude

- Identification of the main components of an aircraft and their basic function both on the ground and in flight; flight deck equipment including weather radar, cockpit voice recorder; basic flight instruments: airspeed indicator, altimeter, magnetic compass, etc.;

- hazards associated with volcanic ash/dust, ice formation on wings and control surfaces, the recognition and reporting of such phenomena;

- characteristics of over-speeding propeller, jet engine blasts, engine disturbances and other in-flight abnormalities such as smoke, fire, fuel leaks, etc., and proper procedures associated with these situations;

- flight control surfaces and flight controls and their function; the four forces (thrust, lift, drag and gravity) acting on an aircraft; the three axes (yaw, pitch and role) and the movement around each axis;

- recognition of aircraft critical surfaces and hazards to flight associated with the contamination of those surfaces; awareness of conditions most likely to produce surface contamination and steps to take if surface contamination is suspected or identified;

- the timely communication of observed or reported deficiencies in the safe operation of the aircraft;

- the meaning of weight and balance; weight distribution and centre of gravity and their effect on aircraft controllability and stability;

- composition of the atmosphere: pressure, density and temperature; basic meteorology: types of cloud formations, air masses and fronts, seasonal weather variations, winds, jet-stream, wind shear, clear air turbulence, etc. and their effects on aircraft operations and cabin environment.

3.5 Physiology of flight

3.5.1 Training objectives

Conditions: Given description (using video, photographs or simulation by a colleague) of people suffering from physiological effects of altitude.

Performances: Cabin attendants shall be able to identify and describe the most common physiological effects of flight in pressurized and non-pressurized aircraft, their likely causes and the means of controlling and minimizing subsequent effects.

Standard of accomplishment:
Correct identification of symptoms and associated problems. Descriptions and demonstration of procedures to mini-mize effects must be within predefined acceptable level.

3.5.2 Required knowledge, skills and attitude

- Physiology of respiration and circulation; the body’s requirement for oxygen and the potential for crew member incapacitation due to lack of oxygen (hypoxia); use of oxygen and oxygen masks;

- physiological effects of altitude and the pressurized cabin;

- circumstances under which carbon monoxide (CO) poisoning may occur, signs and symptoms of poisoning and means of detecting and minimizing its effects;

- physiological effects of pressure changes on gases in the body; hazards associated with hypoxia and means to detect and minimize its effects; identification of persons most susceptible to the effects of hypoxia;

- effects of shiftwork and trans-meridian flight on performance.

CHAPTER 4. DUTIES AND RESPONSIBILITIES

4.1 Introduction

4.1.1 Cabin attendants' normal duties and responsibilities should be well structured and adequate procedures for their performance must be established. This is to say that their pre-flight, in-flight and post-flight duties and responsibilities must be clearly defined and understood both by the cabin attendants, the flight crew and the airline management.

4.1.2 In addition to the duties and responsibilities assigned to cabin attendants in air transport operation, cabin attendants also have general responsibilities which, among other things, encompass their relationship with other operational personnel (e.g. flight crew members, aircraft dispatchers, line maintenance personnel, etc.) and non-operational personnel such as airport customs and immigration officials, health and sanitary officers, airport security, etc. Those responsibilities need to be explained and their contribution to safety, as applicable, explored during initial training and kept up-to-date through recurrent training or company information.

4.2 Ground duties and responsibilities (pre-flight and post-flight including taxiing)

4.2.1 Training objectives

Conditions: Simulated situations.

Performance: Cabin attendants shall recognize the importance of, and be able to carry out in accordance with approved standard company operating procedures, the safety-related functions required of them. Cabin attendants shall be able to effectively apply procedures designed to ensure the safety of passengers during boarding, taxiing and dis-embarkation.

Standard of accomplishment:
Safety-related procedures must be 100 per cent correct. Other procedures can accept lower standards.

4.2.2 Required knowledge, skill and attitude

- Crew members' pre-flight briefings including crew communication and co-ordination, establishing expectations and clarifying procedures; impact on safety of participation in crew briefings which shall include:

  — benefits of crew co-ordination on working environment and morale and the effect this has on flight safety;

  — briefing on other crew members' duties, responsibilities, workload and expectations especially in abnormal and emergency situations; position assignments;

  — procedures for effective communication in normal, abnormal and emergency situations; the importance of effective communication and the potential hazard to flight safety if communi-cation is not effective;

  — crew members' responsibility to provide complete and accurate information to assist in decision making; danger of making assump-tions; importance of taking the initiative to relay all safety-related information in a timely, accurate and comprehensive manner;

  — the effects of and differences between verbal and non-verbal communication and the danger of communicating different messages;

  — the responsibility to use common terminology and the negative impact on flight safety of not adhering to standard terminology; and

— procedures applied to complete cabin and passenger safety pre-flight, in-flight and pre-landing checks and their impact on flight safety; review of emergency signals;

- components of apron safety, the responsibilities for passenger movement on airport aprons and procedures established to facilitate passenger movement on airport aprons, lounges, air bridges, etc.;

- checking and verifying the contents of all necessary documentation, publications and manuals required; ensure that they are up to date and readily available on board the aircraft;

- checking and verifying location and serviceability of all personal safety equipment required;

- checking and verifying the availability of all safety and emergency equipment required on board the aircraft, ascertain serviceability and proper stowage according to standard operating procedures; procedures for reporting discrepancies;

- checking for conditions which may have airworthiness implications and which should be brought to the immediate attention of the pilot-in-command (e.g. cracked windows, damaged door seals, obvious structural damage, excessive leaks, etc.); proper procedures for reporting and/or logging (snugging) unserviceable equipment during all phases of flight;

- pre-take-off passenger safety briefings, knowledge and understanding of practical importance of mandatory announcements and when they must be performed; knowledge and operation of equipment used in passenger safety briefings;

- briefing requirements for passengers requiring special handling;

- procedures for handling special passengers including safety briefings and seating restrictions (e.g. the disabled, prisoners, government and law enforcement officials, deportees, etc.);

- procedures associated with the seating of passengers including seating restrictions, proper selection of passengers seated at emergency exit row seats, and relocation of passengers in compliance with seating procedures; acceptance and use of infant/child restraints;

- cabin attendant responsibilities for passenger supervision while the aircraft is on the ground;

- impact of conducting non-safety-related passenger services during boarding of passengers and while aircraft is taxiing for take-off; importance of, and techniques for, gaining total passenger attention for safety briefing during boarding and taxiing;

- importance of cabin attendant being in assigned position with restraints secure during taxi and critical phases of flight and consequences of non-compliance; procedures to ensure cabin attendants are seated while aircraft is taxiing if not performing safety-related duties;

- identification of cabin attendant stations and use of safety belts; correct method of sitting in cabin attendant seats; silent review of emergency procedures prior to take-off and landing; procedures to identify how long cabin attendant is to remain seated with safety belts fastened after take-off and landing;

- procedures for passenger service (when circumstances warrant) on the ground; importance of crew communication and co-ordination whenever passenger service is being offered on the ground;

- procedures to ensure that cabin aisles and exit areas are not obstructed by use of serving carts while aircraft is on the ground;

- regulations and procedures relating to alcoholic beverages and handling passengers who appear to be intoxicated;

- regulatory requirements and procedures established regarding fuelling of aircraft with passengers on board and identification of potential hazards to occupants associated with aircraft fuelling and proper steps to be taken should problems develop during fuelling;

- procedures regarding acceptance and stowage of carry-on baggage, both crew and passenger bags, and any applicable restrictions including safety implications of improperly stowed carry-on baggage; identification of prohibited items which may be carried into the aircraft as carry-on baggage;

- procedures for notifying the flight crew when cabin is secure for take-off, or notification by cabin attendant to flight crew if movement or take-off must be delayed;

- safety procedures associated with aircraft movement on the ground and the capacity to implement them effectively;

- enforcement of smoking and non-smoking regulations and procedures for handling non-compliance;

- responsibility of cabin attendants to brief the new crew (in instances of crew change) regarding any unserviceability, special passengers and any other safety-related matters pertinent to the flight; procedures for completing safety-related documentation and report.

4.3 In-flight duties and responsibilities (take-off, climb, cruise, descent and landing)

4.3.1 Training objectives

Conditions: Simulated situations.

Performance: Cabin crew members will be able to carry out their safety-related in-flight functions required in accordance with approved standard company operating procedures. Cabin attendants shall be able to recognize abnormal situations related to their working environment, be able to communicate and co-ordinate with flight crew and deal with the problem appropriately.

Standard of accomplishment:
Safety-related procedures must be performed in perfect accordance with company operating procedures. All abnormal situations should be correctly identified.

4.3.2 Required knowledge, skill and attitude

- Safety procedures in normal flight and emergency situations associated with take-off, climb, cruise, descent and landing and the capacity to apply them as appropriate;

- importance of listening to all announcements in the event that the announcement may contain emergency signals or information;

- importance of being constantly alert to any possible situation affecting flight safety and the safety of passengers and crew (e.g. smoking in non-smoking areas, safe stowage of service carts, etc.) and procedures to report any abnormality with the aircraft, its equipment or occupants to the pilot-in-command; procedures for relaying critical safety information to flight crew members during all phases of flight;

- procedures associated with entry to the flight deck; pilot-in-command authority to give permission for access to the flight deck; definition and safety implications of critical phases of flight and procedures associated with the concept of a sterile flight deck;

- security of cockpit door (locking and unlocking procedures and timing);

- policies and procedures for the acceptance and use of electronic devices on board aircraft; understanding the effects of the use of electronic devices on aircraft avionics during critical phases of flight; procedures for identifying device violations and enforcing regulations;
- procedures for dealing with crew incapacitation, its impact on flight safety; communication and co-ordination procedures to ensure that the duties of an incapacitated cabin attendant are assumed;

- regulatory requirements and cabin crew responsibilities regarding passengers who appear to be impaired due to alcohol or drugs;

- general effects of hypoxia; recognition; aggravation by exertion; individual susceptibility in healthy persons; increased susceptibility in some medical conditions; distinction between supplemental and medical oxygen; relationships of altitude and time-of-useful-consciousness (also covered in Chapter 5 — *Emergency procedures* and Chapter 8 — *Hygiene, aviation medicine and first aid*);

- procedures for oxygen administration, recognition of situations when oxygen may need to be administered;

- hazards associated with turbulence and the procedures for ensuring passenger and crew safety during periods of in-flight turbulence;

- understanding of seat belt regulations, compliance and enforcement techniques and responsibilities; policies regarding cabin attendant security; security of passenger service equipment during turbulence;

- procedures to stow serving carts during periods ofin-flight turbulence; identify categories of turbulence and their effects on persons and objects in the cabin;

- policies regarding communication with flight crew during turbulence; importance of crew co-ordination and communication;

- importance of proper cabin attendant positioning during turbulence, landing and taxi;

- characteristics associated with fuel dumping and procedures established to report any unusual conditions observed by cabin attendant or passenger to the pilot-in-command;

- procedures to report suspected surface contamination to the pilot-in-command as soon as it is discovered either by the crew member or passenger.

CHAPTER 5. EMERGENCY PROCEDURES

5.1 Introduction

5.1.1 There is one major objective for the training of cabin attendants in emergency procedures: cabin attendants will be able to immediately recognize an emergency situation, rapidly gain awareness of situational dynamics, anticipate other sources of danger which may occur as a result of the action they choose to take and take appropriate action to mitigate the emergency situation.

5.1.2 The pilot-in-command is responsible for initiating emergency procedures. However, experience shows that during emergency situations the workload on the flight crew may lead to a breakdown in instructions being conveyed to the cabin crew. It is therefore vital that cabin attendants are trained to recognize an emergency situation, if necessary to initiate communication with the flight crew in order to receive instructions, and/or take necessary emergency measures to deal with situations in their immediate areas of responsibility.

5.1.3 Safety training, such as that given to cabin attendants, where information of a fundamental nature (e.g. location of emergency equipment, identification of different types of fire extinguishers, position of emergency exits, etc.) has to be thoroughly learned by the student, requires the use of training aids. Such training may be accomplished in full-fledged mock-ups (simulators) or actual aircraft. Reduced-scale models of the aircraft interior, videos, films and posters are useful supplemental training tools. One important element to be remembered is that these aids should be made available for use by students at all times. Emergency procedures training can only be effective if classroom instructions are concurrently augmented by hands-on exercises and practical demonstrations.

5.1.4 All hands-on exercises and practical demonstrations using mock-ups or actual aircraft should be carried out giving special regard to the safety measures and precautions laid down in the operations manual. To insure satisfactory familiarization with procedures and equipment to be used, practical demonstrations and emergency procedure exercises should be carried out frequently and regularly during the course. It is highly recommended that joint flight crew/cabin crew emergency training exercises are held at least once during initial training and as often as possible throughout recurrent training programmes. Such scheduling can help to reflect the operational environment of air transport operation and instill a *one-crew* concept among all crew members. Joint emergency training and exercise can ensure co-ordination of cabin and flight crew procedures, give flight crew and cabin attendants a greater insight into their respective duties and areas of responsibility and enable them to work as a synchronized team with a sound appreciation of each others' contribution toward successful management of an emergency situation. Appreciating the role of each crew member's responsibilities will enhance crew co-ordination, the results of which can only be an effective resolution of an emergency situation.

5.1.5 Professionals that deal with emergency situations, such as fire fighters, usually hone their skills during hands-on training, drills and participation in actual emergencies. Conversely, cabin attendants receive training to manage emergency situations but rarely have the opportunity to fully practice the skills acquired during training. Emergency procedures, such as those required to prepare an aeroplane for an evacuation or ditching, extinguish an in-flight fire, supervise the cabin following decompression, handle an unlawful interference (hijack, bomb threats) situation or manage passengers during an emergency evacuation are difficult to realistically simulate. However, use of modern training and simulation systems such as computer-based training (CBT) systems, intelligent tutoring systems (ITS), full scale emergency evacuation trainers, aircraft cabin simulators, etc., offers an acceptable level of practical experience close to what can be expected in actual occurrences. It is, therefore, strongly suggested that uses of such training and simulation aids be a standard requirement designed into the training programme of cabin attendants. However, the absence of sophisticated training devices should not be an excuse not to conduct comprehensive hands-on training drills and role-playing exercises.

5.1.6 All emergency exercises in a training environment should be planned using full crew complement including both flight crew and cabin attendants. Full crew exercises emphasize the importance of crew communication and co-ordination and promote the notion of team work. Such exercises are best conducted with the trainees formed into crew complements and the allotted duties for each cabin attendant rotated periodically. Drills should also be conducted in which the cabin attendant finds him/herself acting alone (simulating incapacitation of other cabin attendants). The "solo" drill demonstrates the ability of the cabin attendant to take command of a situation, measures knowledge and the ability to use available safety equipment and the capacity to respond to emergency situations, appropriately, without the assistance of fellow crew members. The use of trainees and employees acting the role of passengers is desirable in simulations of on-board fire, smoke removal, rapid decompression, ditching, emergency landing and aircraft evacuation. Such simulation enables

students to experience the flow-rate and the time element involved and allows for an assessment by the instructor that the prescribed rate has been achieved. Air carriers should use a checklist to ensure that each cabin attendant trainee participated as a crew member in such drills.

5.1.7 Most emergencies take place without warning. Crew members must always be alert and mentally prepared for unexpected emergencies. Aggressive and professional leadership by cabin attendants during any emergency situation is a major factor which significantly improves the chances of survival in an emergency situation. Cabin attendants should be encouraged to mentally rehearse emergency procedures during normal flights and review the location and use of emergency equipment during routine pre-flight checks. For cabin attendants to succeed in their safety-related mission, operators must establish policy and approved procedures for the evacuation of special passengers (e.g. unaccompanied minors, incapacitated passengers, wheelchair and stretcher passengers, etc.).

5.2 General emergency procedures

5.2.1 Training objectives

Conditions: Simulated emergency situations, using actual aeroplane mock-ups or simulators, or actual aircraft which may be supplemented by films and videos.

Performance: The trainee will be able to recognize, identify and describe the different types of emergency situations which may occur in-flight or at any time on board the aircraft and respond appropriately.

Note.— The training should be organized in such a way as to assist cabin attendants in developing confidence in themselves and other crew members in dealing with emergency situations. Usually a gradual approach to frightening/difficult situations works better than an immediate and direct exposure to the most critical situations.

Standard of accomplishment:

Emergency situations must be correctly recognized, identified (type of emergency, extent of the problem, possible ensuing consequences and applicable procedures). Time limits for identifying the type of emergency and performing the corresponding procedures should be established where applicable.

5.2.2 Required knowledge, skill and attitude

- Understanding of critical time elements during emergencies;
- recognition of the different types of emergencies and ability to respond appropriately;
- need for planned procedures and emergency assignments;
- crew co-ordination and communication and the development of mutual confidence in crew members;
- ability to take initiative and properly implement appropriate emergency procedures;
- situational control and prevention of passenger panic condition;
- need for assertive leadership, taking command of the situation and assuming additional responsi-bilities should other crew members be incapacitated or otherwise unable to respond (best taught by supplying some suitable case histories as illustrations and role playing).

5.3 Emergency equipment

5.3.1 Training objectives

Conditions: Using an actual aircraft or a mock-up (for equipment identification and location), and given corresponding simulated conditions and standard on-board equipment (for actual use of equipment).

Performance: The trainee will be able to identify safety and emergency equipment carried on board the aircraft and describe and demonstrate their pre-flight check and procedures to be used if deficiencies are noted. Demonstrate the primary use and limitations of emergency equipment, procedures associated with their operation and acquire the skill to use them properly, rapidly and under adverse conditions (as in use of fire extinguisher while blindfolded, simulating smoke-compro-mised vision or in confined area).

Standard of accomplishment:

All safety equipment carried on board the aircraft (or mock-up) must be correctly identified, and corresponding pre-flight check, procedures for reporting deficiencies, removal from securing bracket, and primary use and limitations clearly described. Under simulated situations, equipment will be used in accordance with established operation policy/procedures. Time limits to locate equipment and execute procedures should be established where applicable.

Note.— A checklist should be used to ensure that all steps are followed, and that each trainee performs hands-on drills on each piece of emergency equipment.

5.3.2 Required knowledge, skill and attitude

- Location, pre-flight check and operation of components of passenger and crew oxygen systems and of portable oxygen units;
- location, pre-flight check and use of smoke masks or goggles in connection with portable oxygen unit;
- location, pre-flight check and use of protective breathing equipment;
- location and pre-flight check of fire extinguishers, their different types, chemical properties, purposes, duration, methods of use, after-use care and limitations;
- location, pre-flight check and use of crash axes;
- location, pre-flight check and operation of emergency lighting facilities; emergency floor path lighting; flashlights;
- location, pre-flight check and operation of emergency exits and how their location in relation to the wing and to engine and fuel tank positions might impact their availability and usefulness during an emergency;
- location, pre-flight check and operation of life-jackets, baby survival cots, escape ropes, escape slides, life-rafts and slide-rafts;
- location and pre-flight check of first-aid medical supplies (first-aid and medical kits);
- location, pre-flight check and use of megaphones and emergency locator transmitters (ELT).

5.4 Fire fighting

5.4.1 Training objectives

Conditions: Different types of fire on mock-ups.

Note.— It is recommended that fire fighting exercises are performed in a confined environment

with cabin attendants donning personal breathing equipment (PBE).

Performance: The trainee will be able to identify the different types of fire, describe the fire detection and appropriate fire fighting systems and apply established fire fighting procedures as appropriate.

Standard of accomplishment:

Correct identification of type of fire and corresponding fire extinguishing procedures to be used. Selection and proper use of fire fighting equipment (fire must be extinguished and not reignite), and proper handling of passenger and crew communication.

5.4.2 Required knowledge, skill and attitude

- Identification of the different types of fire, means of fire detection, fire fighting systems and established fire fighting procedures;
- understanding of fire prevention techniques (monitoring smoking in the cabin and lavatories, inspecting integrity of automatic lavatory trash bin extinguisher, preventing ignited materials from being discarded in trash carts, identifying and eliminating hazardous flammable materials);
- techniques and procedures for fighting fires including finding and approaching the source of the fire, type of extinguisher to use (e.g. CO_2, water glycol, halon, etc.), additional fire fighting equipment needed such as smokehoods, techniques for using extinguishers and communicating while using smokehoods;
- fire fighting procedures for specific types of fires (e.g. galleys, oven, lavatories, electrical, upholstery, etc.);
- specific crew member responsibilities for on-board fire fighting and the importance and responsibility of being prepared to implement appropriate fire fighting procedures;
- importance of crew communication and co-ordination in fighting an in-flight fire and providing the pilot-in-command with accurate information on fire source, location, extent/severity of fire/smoke and fire fighting actions taken; whether or not passengers should be displaced;
- impediments to fire fighting on board aircraft including limited visibility due to smoke/fumes, fire fighting in confined space, difficulty in locating/accessing the source of fire and resources to fight the fire;
- hazards associated with on-board fires including toxicity of smoke/fumes, flammability of cabin materials, variety of combustible materials;
- external fires (e.g. engine fires, fuel spill/apron fires, fires on loading bridges, service vehicle fires, etc.) which could affect flight safety and procedures established for dealing with such fire situations including recognition, crew communication and crew co-ordination;
- communication and co-ordination required with ground personnel on fire fighting assistance required from ground personnel and the assistance crew members can provide to ground personnel;
- post-fire procedures.

5.5 Smoke removal procedures

5.5.1 Training objectives

Conditions: Given visual description (using simulated demonstration, films, video, etc.) of smoke/fume presence in the aircraft cabin.

Performance: The trainee will be able to describe the hazards associated with smoke and/or fumes in the aircraft

cabin, identify and describe potential sources and smoke detecting systems and apply established procedures for removal of smoke/fumes from the cabin as appropriate.

Standard of performance:

Procedures applied must be correct and in accordance with the procedures recommended in the aircraft operations manual or the manufacturer's aircraft operating manual.

5.5.2 Required knowledge, skill and attitude

- Potential hazards to passengers and aircraft associated with smoke and/or fumes in the cabin, recognition of potential sources of smoke and procedures for dealing with smoke/fumes including locating the source, notifying the pilot-in-command, crew co-ordination, means of ensuring passengers' breathing comfort (e.g. use of wet cloth), dangers associated with the use of oxygen in fire situation and preparation for rapid evacuation;
- procedures for smoke removal including crew communication, crew co-ordination and passenger management;
- precautions to be taken before opening emergency exits for smoke removal purposes and methods for opening and replacing emergency exits.

5.6 Emergency lighting

5.6.1 Training objectives

Conditions: Actual aircraft, a simulator or a mock-up.

Performance: The trainee will be able to identify and properly activate emergency lighting systems available under differing abnormal conditions and be able to communicate, using light signals, with other crew members.

Standard of accomplishment:

Correct identification and proper use of available system for each differing abnormal situation. Light signals used to communicate with other crew members made in accordance with code established in operations manual.

5.6.2 Required knowledge, skill and attitude

- power failures;
- operation and use of emergency evacuation lights; floor path lighting and flashlights;
- knowledge of emergency lighting limitations;
- use of signal light;
- transmitting of SOS signals.

5.7 Rapid decompression and cabin pressurization problems

5.7.1 Training objectives

Conditions: Given description and demonstration (using films, video, etc.) of emergency situation.

Performance: The trainee will be able to describe (recognize) a rapid decompression and cabin pressurization problem, describe associated crew responsibilities and be able to apply appropriate established procedures for dealing with each condition.

Standard of accomplishment:

All indications of rapid decompression/loss of pressurization identified. Appropriate procedures applied and emergency equipment identified and used appropriately.

5.7.2 Required knowledge, skill and attitude

- Recognition of conditions in the cabin and the potential threat to flight safety caused by rapid and slow decompressions;
- concept of cabin altitude profiles during rapid decompressions and cabin pressurization problems; potential causes of rapid decompression (e.g. fuselage failure, window/door blowout, air pack failure, etc.) and cabin pressurization problems (e.g. door seal leaks, cracked windows, system malfunctions, etc.);
- immediate actions required to be taken in the case of rapid decompression, cabin pressure leaks; operation of manually and barostatically controlled passenger oxygen systems and the operation and various uses of portable oxygen units and the use of oxygen masks;
- procedures for inter-crew communication and co-ordination; to passenger communication during a rapid decompression and cabin pressurization problems; identification of specific information to be relayed to the flight crew and back-up means of communication should normal systems be rendered inoperative (e.g. structural damage);
- knowledge of anticipated flight crew response (e.g. rapid descent or depressurization) and its effect on the cabin and its occupants;
- need of cabin attendant to obtain oxygen first before attending to passengers' needs;
- effects of rapid decompression on any unsecured objects or persons in the immediate area of a problem;
- effects on the human body of reduced atmospheric pressure;
- hypoxia: elementary physiology of oxygen intake and utilization;
- general effects of hypoxia; recognition and dangers associated with hypoxia's euphoric effect; aggravation by exertion; individual susceptibility in healthy persons; increased susceptibility in some medical conditions; distinction between supplemental and medical oxygen; altitude/time-of-useful-consciousness relationships (duration of consciousness without supplemental oxygen);
- body gas volume changes: abdominal pain on cabin altitude ascent; "blocked ears" on emergency descent of aircraft;
- post-decompression duties.

5.8 Evacuation

5.8.1 Training objectives

Conditions: Simulated conditions requiring an evacuation exercise.

Performance: The trainee will be able to identify the types of evacuation, conditions under which a cabin attendant might need to initiate an evacuation, describe crew responsibilities and be able to apply procedures relating to the different types of evacuation situations and demonstrate acquired skills.

Standard of accomplishment:

All procedures must be in accordance with the aircraft operations manual. Tasks and procedures must be applied following prescribed sequence and according to required priority. Evacuation exercise should be performed within pre-established time limits as applicable.

5.8.2 Required knowledge, skill and attitude

Note.— Checklists should be developed to ensure emergency procedures be developed in order of priority and that all steps are addressed from most important (first) to least important (last).

- Identification of evacuation signs and commands; crew notification and co-ordination;
- maintaining situational awareness and ability to anticipate and adapt as emergency develops;
- preparation for emergency evacuation on land and on water: cabin crew duties; the bracing position; precautions and adaptations for passengers with special needs; time element and time management; synthetic clothing and fire or excessive heat; donning of life jackets; various possible aircraft attitudes and associated evacuation procedures;
- importance of selection and briefing of able-bodied passengers (ABP) assigned to care for special-needs passengers, to hold passengers back until exits can be assessed and opened, to first go down the slide (with a cabin attendant) and to stay at the bottom of the slide and assist other passengers as well as to hold the slide steady in case it is buffeted by the wind;
- need to establish communication with flight crew and obtain specific information (e.g. time available, special instructions if necessary, etc.);
- importance of establishing and following procedures in a specific sequence to ensure that priority items are identified and accomplished first; the importance of following checklist in planned emergencies;
- need to assess exits before opening and to identify alternates; importance of using all available exits;
- emergency evacuation of passengers: crew duties, evacuation on land, on water; escape routes; the time element;
- passenger problems in evacuation: recognizing the different types of passenger behaviour (e.g. passive, aggressive, hysteric, etc.) and managing passenger responses; flow control; use of public address system; types of announcements to passengers; avoiding panic; imparting confidence; use of verbal and non-verbal commands;
- time elements in evacuation: proper briefing of passengers regarding timing of evacuation, number of impacts, signals and commands for starting evacuation, etc.; the effects of smoke and noxious fumes; methods for expediting evacuation;
- factors affecting survivability in evacuation such as fuselage breakups, smoke, fire, etc.;
- ability to respond in hostile environment (smoke, darkness, fire, etc.);
- responsibility of crew members to assist passengers and incapacitated fellow crew members in an evacuation; limitations to this responsibility and conditions when crew members should evacuate themselves;
- importance of crew communication in an evacuation and the established communication signals for evacuations;
- situational awareness of crew members and requirements for crew members to be aware of their duties and the duties of other crew members during evacuation and the responsibility for taking over other crew members' duties if required;

- crew members' responsibility after an evacuation (e.g. grouping passengers, assisting with first aid, etc.);
- unwarranted evacuation; causes and management;
- post-crash procedures to increase survivability under all conditions including sea, desert, polar and mountain areas;
- knowledge of international rescue organizations likely to come to the aid of survivors.

5.9 Use of life- and slide-rafts

5.9.1 Training objectives

Conditions: Simulated conditions.

Performance: The trainee will be able to describe the use and operation of life/slide-rafts, identify emergency survival equipment carried on board rafts and be able to apply appropriate procedures for the use of survival equipment. Demonstrate skill in the operation of life/slide-rafts.

Standard of accomplishment:
All procedures must be in accordance with the aircraft operations manual. Tasks and procedures must be applied following prescribed sequence and according to required priority. Evacuation exercise should be performed within pre-established time limits as applicable.

5.9.2 Required knowledge, skill and attitude

- Proper arming, activation and deployment of slides and rafts;
- importance of proper and timely arming of all doors and slides; importance of ensuring that door/slide is not accidentally disarmed prior to emergency opening;
- methods for automatic and manual activation;
- removal from stowage points and positioning at exits; time elements; harness attachment; attachment of static lines; raft buoyancy; static line breaking strain; danger of premature inflation; distribution of emergency packs; ejection of life-rafts, inflation, and boarding;
- transporting incapacitated persons from the aircraft into the rafts;
- puncture prevention; emergency repair;
- method of raising aerial; method of operating emergency radio, emergency locator transmitters; transmitting frequencies; range of signals; effect of length of aerial; caution to be observed with aerial if lightning present; international emergency frequency listening watch periods; auto alarm system;
- distress signalling; radio; heliographs; pyro-technics; visual strips.
- aquatic survival techniques and human physio-logical limitations in water;
- transmitting signals at time of sunrise/sunset ormoonrise/moonset as aid in establishing position.

5.10 Unlawful interference

5.10.1 Training objectives

Conditions: Simulated condition (role playing by instructor and trainees) on actual aircraft, mock-up or classroom.

Performance: The trainee will be able to describe the operator's security programmes, measures and procedures developed to ensure safety on board the aircraft and act in the most appropriate manner to minimize the consequences of unlawful interference.

Standard of accomplishment:

All procedures must be performed in accordance with established government/operator policy.

5.10.2 Required knowledge, skill and attitude

- Preventive measures and techniques in relation to passengers, baggage, stores and supplies intended for carriage on an aeroplane;
- procedures for performing aircraft cabin security sweep on initial boarding of aircraft, an aircraft left unsecured during a stopover or as deemed appropriate by the operator or State authorities;
- procedures for managing intoxicated passengers who may interfere with the normal operation of the aircraft or/ and threaten the well-being of passengers and/or crew members;
- procedures for managing disruptive or problem passengers by using a team approach or specific techniques designed to defuse such situations;
- procedures for handling smokers in non-smoking flights;
- procedures to be followed in the event of crew member assault;
- procedures for dealing with hijackers, circumstances permitting, and techniques for managing (handling) distressed passengers and those who might jeopardize aircraft or passenger safety;
- procedures for the handling of suspect baggage on board an aircraft;
- procedures for the handling of bomb threats on the ground and in the air;
- procedures for informing (advising) flight crews of an act of unlawful interference inside the cabin including the presence of suspect baggage.

CHAPTER 6. CARRIAGE OF DANGEROUS GOODS

6.1 Introduction

6.1.1 Carriage of dangerous goods by air is regulated in Annex 18 to the Convention supplemented by the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (ICAO Doc 9284). Except in circumstances permitted by the provisions of the Technical Instructions, dangerous goods shall not be carried in an aircraft cabin occupied by passengers or on the flight deck of an aircraft. Nevertheless, dangerous goods are sometimes carried into the cabin of an aircraft by passengers who are unaware of, or deliberately ignore, the requirements of the Technical Instructions concerning passengers and their baggage. It is also possible that an item to which a passenger is legitimately entitled (e.g. an item for medical purposes) may cause an accident.

6.1.2 Spillage or leakage of dangerous goods can cause smoke/fumes or even fire (spontaneous combustion) and it is possible that dangerous goods loaded in the belly of the aircraft can be affected by smoke or fire and exacerbate the problem. For this and other associated reasons cabin attendants must receive training in the requirements commensurate with their responsibilities. A cabin crew checklist for dangerous goods incidents in the passenger cabin during flight, Table 6-1, is included in this chapter to familiarize trainees with their responsibilities.

6.2 Training objectives

Conditions: Given visual description of prohibited dangerous goods and exceptions.

Performance: The trainee will be able to describe the general provisions of the transport of dangerous goods by air commensurate with cabin attendants' responsibilities, safe handling of dangerous goods in flight, identify the hazards presented by dangerous goods and apply appropriate emergency response procedures.

Standards of accomplishment:

Response procedures should be in accordance with cabin crew checklist for dangerous goods incidents in the passenger cabin during flight (Table 6-1) and related instructions from the aircraft operations manual, ICAO Technical Instructions, etc.

6.3 Required knowledge, skill and attitude

- General philosophy; dangerous goods prohibited; exceptions for passengers; general label identification; emergency procedures.

6.4 Checklists for dangerous goods incidents

Note.— Instructors and trainees may wish to refer to ICAO Doc 9481, Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods, *paragraph 3.4, for an amplified checklist for dangerous goods incidents in the passenger cabin during flight.*

CHAPTER 7. HUMAN FACTORS

Note.— For more detailed information on the importance of Human Factors on civil aviation operations, instructors and trainees are advised to refer to ICAO Human Factors Digests 1 through 12. Human Factors Digest No. 1 — Fundamental Human Factors Concepts *is essential reading for those who would like to acquire an understanding of aviation Human Factors.*

7.1 Introduction

7.1.1 Lapses in human performance are cited as causal factors in the majority of accidents. If the accident rate is to be decreased, Human Factors must be better understood and Human Factors knowledge more broadly applied. Increasing awareness of the importance of aviation Human Factors presents the international aviation community with a single most significant opportunity to make aviation both safer and more efficient. The purpose of this chapter is to introduce cabin attendants to fundamental Human Factors concepts in aviation and provide guidelines for introducing crew resource management (CRM) concepts in the emergency training and exercise phases of cabin crew training.

7.2 The meaning of Human Factors

7.2.1 Human Factors as a term has to be clearly defined because when these words are used in the vernacular they are often applied to any factor related to humans. The human element is the most flexible, adaptable and valuable part of the aviation system, but it is also the most vulnerable to influences which can adversely affect its performance. Throughout the years, some three out of four accidents have resulted from less than optimum human performance.

7.2.2 Human Factors is a technology which deals with people: it is about people in their working and living environments, and it is about their relationship with machines, equipment and procedures. Just as important, it is about their relationship with each other as individuals and in groups. It involves the over-all performance of human beings within the aviation system. Human Factors seeks to optimize the performance of people by the systematic application of the human sciences, often integrated within the framework of system engineering. Its twin objectives can be seen as safety and efficiency.

7.2.3 Human Factors has come to be concerned with diverse elements in the aviation system. These include human behaviour; decision-making and other cognitive processes; the design of controls and displays; flight deck and cabin layouts; communication and software aspects of computers; maps, charts and documentation; as well as training.

7.2.4 Cultural differences have been recognized as issues of concern to Human Factors. The subject has been studied by many Human Factors specialists and, as is the case with many Human Factors issues, the jury is still out and universal definition and explanation have yet to be determined. In the context of crew members' training, issues on cultural differences should be addressed in the light of the misunderstanding that may be created among crew members of differing cultural backgrounds and the resulting possible break in communication and co-ordination. Trainees, especially those destined to operate in multinational crew composition, must be made aware of the significance of cultural differences and the importance of respecting each other's culture. Addressing the issue, instructors must exercise caution as discussion on cultural differences is subject to misunderstanding and can result in unnecessary friction. During this phase of the training, emphasis should be put on the development of organizational culture which encourages a team work approach to crew members' responsibilities.

7.2.5 In spite of the reliance on the academic sources of information, aviation Human Factors is primarily oriented toward solving practical problems in the real world. There are a growing number of integrated Human Factors techniques or methods; these varied and developing techniques can be applied to problems as diverse as accident investigation and the optimization of personnel training.

7.2.6 It is most important that all concerned with the operation and administration of the aviation system recognize the inevitability of human error. No person, whether designer, engineer, manager, controller or crew member can perform perfectly at all times. Also, what could be considered perfect performance in one set of circumstances might well be

unacceptable in another. Thus, people need to be seen as they really are; to wish that they be intrinsically "better" or "different" is futile, unless such a wish is backed by a recommendation for remedial action. Such a recommendation can be further supplemented by the provision of means to achieve better design, training, education, experience, motivation, etc., with the objective of positively influencing relevant aspects of human performance.

7.2.7 An understanding of the predictable human capabilities and limitations and the applications of this understanding are the primary concerns of Human Factors. Human Factors has been progressively developed, refined and institutionalized since the end of the last century, and is now backed by a vast store of knowledge which can be used by those concerned with enhancing the safety of the complex system which is today's civil air transport system.

7.3 Crew resource management (CRM)

7.3.1 Crew resource management training is but one practical application of Human Factors. Although CRM can be approached in many different ways, there are some essential features. The training should focus on the functioning of crew members as a team, not simply as a collection of technically competent individuals, and should provide opportunities for crew members to practise their skills together in the roles they normally perform in flight. The programme should teach crew members how to use their interpersonal and leadership styles in ways that foster crew effectiveness. The programme should also teach crew members that their behaviour during normal, routine circumstances can have a powerful impact on how well the crew as a whole function during high-workload, stressful situations. Similar situations experienced in training increase the probability that a crew will handle actual stressful situations more competently.

7.3.2 Research studies from the behavioural sciences strongly suggest that behaviour change in any environment cannot be accomplished in a short period of time, even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will long endure. To be effective, CRM training must be accomplished in several phases and over several years.

7.3.3 Accordingly, CRM training should include at least three distinct phases:

a) an awareness phase where CRM issues are defined and discussed;

b) a practice and feedback phase where trainees gain experience with CRM techniques; and

c) a continual reinforcement phase where CRM principles are addressed on a long-term basis.

7.4 Awareness

7.4.1 Awareness is the essential first phase and usually comprises instructional presentations focusing on the roles of interpersonal and group factors in the maintenance of crew co-ordination. It is important because it provides a common terminology and a conceptual framework for crew members to begin thinking about crew co-ordination problems and how such factors have contributed to accidents and incidents in the past. A useful way of beginning the awareness phase might be to introduce CRM skills as they pertain to communication, situation awareness, problem solving, etc. Actual situations in which crew co-ordination and communication had a direct impact on the outcome of the event should be examined and the positive and negative interactions reviewed.

7.4.2 It is important to recognize that awareness is only a first step; classroom instruction alone will probably not significantly alter crew member attitudes and behaviour in the long term.

7.5 Practice and feedback

7.5.1 The second phase of CRM training is practice and feedback. Some programmes use role-playing techniques to provide group skills practice, as well as attitude-measuring questionnaires as a means of providing feedback to individuals on their own interpersonal styles, some aspects of which they probably have not previously evaluated. Attitude insights allow individuals to recognize some of their strengths and weaknesses. However, alone they may not provide guidance on

how those attitudes will positively or negatively affect each situation. Role-playing or group exercises can provide useful practice in areas of crew decision-making and other skills discussed in the awareness phase of the CRM curriculum. They can also demonstrate the critical responsibility of each crew member and the effect of stress on crew members' abilities to perform their specific tasks under actual emergency situations. The inter-relationship between the actions of all crew members must be examined.

7.5.2 Videotape feedback is particularly effective because the third-person perspective creates a level of awareness not possible with other techniques. This perspective provides insight and provokes "self-critique" which appears to be a strong stimulant for attitude and behaviour change. It is easy to identify less-than-optimum managerial or interpersonal styles if one sees it for oneself. Moreover, these video feedback exercises will provide opportunities for peer critiques. There is ample evidence for the effectiveness of the video feedback technique, which should be used whenever possible. If video feedback is not possible, each exercise must be followed by a carefully guided debriefing session. Participants should be able to identify the objectives of each exercise and be encouraged to provide constructive feedback on performance ("peer review" should be highly encouraged), identify areas of concern, propose alternatives and relate all exercises to practical experience.

7.6 Reinforcement

7.6.1 The third phase is reinforcement. No matter how effective the CRM classroom curriculum, interpersonal drills, and feedback techniques are, a single exposure will be insufficient. Undesirable attitudes and norms which contribute to ineffective crew co-ordination are ubiquitous and have developed over a crew member's lifetime. It is unrealistic to expect a short training programme to counteract a lifetime of development. For maximum effect, CRM must be embedded in the total training programme, it must be continually reinforced, and it must become an inseparable part of the organization's culture. The last factor is often overlooked; however, it is clear that effective CRM training requires the support of the highest levels of management.

7.6.2 CRM training should therefore be instituted as a regular part of the recurrent training requirement, and should include refresher curriculum and practice and feedback. It is particularly important that some of these recurrent CRM exercises take place with a full crew, with crew members operating in their usual positions. For example, recurrent training emergency evacuation exercises designed for CRM should only be conducted with complete crews. This is stressed because there is a natural tendency to think of CRM as training only for pilots. This belief misses the essence of the primary CRM training objective, which is the prevention of crew-related incidents and accidents. The training will be most effective in the entire crew context and this requires training exercises that include all crew members working and learning together. Exercises should be as realistic as possible and allowed to "play out" without major interference by instructors. Scenarios should be drawn from actual incidents or accidents. And each session must be followed by a thorough debriefing to ensure that proper lessons are learned and "negatives" identified and discussed.

7.6.3 If scheduling constraints do not permit flight crew and cabin attendants to attend joint CRM sessions, limited representation from each crew position should be involved. Videos made during flight crew instruction in a simulator can be shown to cabin attendants to increase their knowledge of flight crew actions during normal and abnormal situations. Flight crew members can be shown videos of cabin attendants carrying out their emergency drills. In extreme cases, cabin attendant instructors may have to play the role of flight crew members during CRM practice exercises.

7.6.4 The importance and value of joint training cannot be overemphasized or adequately replaced. Joint training of flight crew and cabin attendants not only allows for emergency exercises to be conducted in a more realistic environment, it also permits flight crew to interact directly with cabin crew in a less stratified environment, encourages mutual respect, increases the effects of peer pressure to correct negative behaviour, encourages all crew members to actively consider and recognize the needs of each other and directly demonstrates and emphasizes the inter-relationship between actions in the aircraft cabin and on the flight deck.

7.7 Training objectives

Conditions:	Role-playing simulating conditions that require the application of CRM concepts.
Performance:	The trainees will be able to apply concepts learned in CRM training in the performance of their duties and responsibilities. They will be able to develop awareness of "good" versus "poor" performance,

accept the need for supportive and cooperative inter-relationships among crew members and will be able to cope with difficult individuals.

Standard of accomplishment:

During training, recorded performance of trainee can be compared with models provided as references.

7.8 Required knowledge, skill and attitude

Note.— The following list of topics is not complete, nor is it intended to substitute for the conceptual learning which is an integral part of learning skills. However the topics constitute the "language" and awareness that enable skills to be understood and ultimately used in an operational environment.

a) Knowledge to be developed:

- introduce crew members to the concept of human performance as a cause of aircraft accidents;
- a common language or glossary of terms;
- the concept of a synergy (a combined effect that exceeds the sum of individual effects);
- the need for individual commitment to CRM principles;
- guidelines for continued self-improvement (continuation training);
- individual attitudes and behaviour and how they affect the team effort;
- complacency and its effect on team efforts;
- fitness to fly: the concept that each individual is responsible for arriving at work "fit to fly" and the ramifications and refinements of this concept;
- the impact of the organization; company policies and culture;
- resources available: identification and use;
- identification and assignment of priorities;
- interpersonal relationships and their effect on team work: the way in which crew members approach, or respond to each other has a critical effect on team-building and team results;
- "team required" versus "individual" tasks; the notion that some problems require a team solution while others may be solved through individual effort;
- identification of norms (i.e. tacitly accepted actions, procedures and expectations): Whether consistent or deviant with written policy, norms exert strong pressures upon individuals to conform;
- the statutory and regulatory position of the pilot-in-command as team leader and commander; and
- policies and procedures to be followed during the course of instruction, as well as subsequent operations. For example, management support for the programme and concepts taught; management support for those who attempt to act in accordance with learned principles; and absence of punitive action during the course and afterwards in actual flight operations.

b) skills to be developed:
Communication/interpersonal skills — the components of which are:

— information
— cultural influence
— barriers, e.g. rank, age, crew position
— polite assertiveness
— participation
— listening
— feedback
— legitimate avenues of dissent;

Situation awareness — the components of which are:

— total awareness of surrounding environment
— reality versus perception of reality
— fixation/distraction
— monitoring (constant, regular)
— incapacitation: partial/total, physical/mental, overt and subtle;

Problem-solving/decision-making/judgement, which includes:

— conflict management
  response to conflict
  coping with conflict
— review (immediate, ongoing);

Leadership/“followership” — the components of which are:

— team-building
— managerial and supervisory skills: plan, organize, direct and control
— authority
— assertiveness
— barriers
— cultural influence
— roles
— professionalism
— credibility
— responsibility of all crew members
— time/workload management;

Stress management — the components of which are:

— commercial pressure
— workload, fatigue
— fitness to fly: mental and physical
— incapacitation in varying degrees; and

Summary experience (role playing)

Use actual air carrier accidents and incidents to create problem-solving dilemmas that participants must act out and critique through the use of feedback (preferably video playback) system.

CHAPTER 8. HYGIENE, AVIATION MEDICINE AND FIRST AID

8.1 Introduction

8.1.1 Besides their safety-related duties on board aircraft, cabin attendants may be required to administer first aid to passengers. Often, cabin attendants have been called upon to assist in various in-flight medical emergency situations. Considering the nature of their profession, the number of contacts they make with people from different parts of the world, the frequency at which they move from place to place in different continents depending on the type of operation on which they are assigned, cabin attendants need to acquaint themselves with relevant medical terminologies, transmissible diseases, quarantinable diseases, etc., in order to protect themselves as well as other occupants of the aircraft.

8.1.2 Studies have shown that it is very rare for cabin attendants to contract transmissible diseases from passengers. Nevertheless, the likelihood can be reduced further by providing cabin attendants training on the appropriate protection against airborne, fluid-borne, food-borne and insect-transmitted diseases. They must be made aware of body fluids which pose a risk and those which do not. They should also be trained on procedures to follow in case of suspected or actual exposure. The concept of universal precautions and proper workplace controls should be understood and instituted. Personal protective equipment should be used when necessary to reduce risk of exposure.

8.1.3 As the number and average age of air travellers increase, more will develop illness in flight. When a passenger is taken ill in flight, the cabin attendants become responsible for assisting the person by administering appropriate treatment. This requires that cabin attendants are trained in first-aid administration.

8.1.4 Cabin attendants' first-aid training must include basic principles and an overview of commonly occurring medical conditions. It is also recommended that the training include an anatomic and physiologic overview of the human body dealing with important organs and systems. The symptoms of typical illnesses occurring or liable to occur in-flight, including procedures for their temporary treatment, must be described. In addition to theoretical explanations, cabin attendants must receive practical training in cardiopulmonary resuscitation (CPR), life-saving holds and the correct positioning of the body. Bandaging as a first-aid measure must also be practised during training.

8.1.5 Cabin attendants must be trained to recognize that a first-aid emergency exists and be able to provide basic care until trained medical help arrives. Often, cabin attendants lack confidence in their abilities to perform first aid, particularly if their first-aid training goes beyond what is possible and appropriate to provide in flight. Practising first-aid techniques during training increases cabin attendant confidence and lessens anxiety. A quick-reference manual on first-aid treatment of commonly occurring medical conditions should be available on board each aircraft for the use of cabin attendants.

Note.— The operator must establish policy and approved procedures for handling a severe case of illness on board an aircraft and for the use of medical kits if they are carried on board. A copy of the list of contents of the medical kit must be readily available, but in a safe place, for review without the kit being opened.

8.2 Training objectives

Conditions: Given adequate information and explanation on transmissible diseases, first aid and frequent in-flight medical problems,

Performance: Cabin attendants will be able to describe medical aspects related to air transport operation, identify the basis of transmissible diseases and protect themselves and their passengers from such diseases. They will also be able to perform basic first-aid and life-support procedures.

8.3 Required knowledge, skill and attitude

a) *Terminology:*

- Explanation of the following terms: history, sign, symptoms, first aid, medical treatment, management,

prophylaxis, diagnosis, prognosis.

b) Hygiene and climatic conditions:

- range of tropical and arctic environments;
- influence of climatic factors: temperature, humidity, electromagnetic and solar radiation; protective measures.

c) Transmissible disease:

- transmissible diseases (e.g. tuberculosis, hepatitis, AIDS, etc.): means of transmission; risks involved; prevention and available protection;
- risks posed by drinking-water, milk, ice, fruit, salads and raw vegetables, meat and fish and perishable foods (pastries, etc.).

d) International health regulations:

- requirements for vaccination and inoculation;
- exanthematous diseases;
- action to be taken in the event of notifiable disease occurring on aircraft.

e) Food poisoning (nonspecific gastro-enteritis):

- definition; prerequisites; symptoms; treatment; prevention;
- policy and importance of flight crew members or all cabin attendants not eating same dishes.

f) Endemic diseases:

- major diseases endemic in the areas in which the trainees will operate (e.g. malaria); transmission, incubation time, symptoms; precautions; prevention.

g) General in-flight medical emergencies, accidents and incidents:

Note.— Where applicable, instruction on the following topics should include reference to the first-aid manual in local use, and demonstration of the first-aid techniques by a first-aid instructor or the lecturer. Trainees should undergo practical life-support and first-aid training.

- general procedure: inquiry for presence aboard of a medical doctor or trained nurse; whenever possible give pilot-in-command full infor-mation before taking action;
- airsickness; recognition and management;
- personality disturbances in passengers in-cluding effects of alcohol: assessment; management;
- allergic disorders: asthma, hay fever, food allergies; recognition; management;
- birth: in-flight management of normal birth; documentation;
- “blocked ears” (otitic barotrauma): mechanism (demonstrated with sectional model of middle ear, if possible), role of upper respiratory tract infection, allergies, manoeuvres for clearing; action to be advised (passengers) or taken (crew) if no clearing has occurred by end of flight. Stress the frequency and importance of this condition;
- burns: management;
- concussion: management;

- cerebral (brain) disturbances and altered levels of consciousness: recognition and management;
- joint and limb injuries: recognition; first-aid treatment of sprain, dislocation, fracture;
- wounds: distinguishing arterial from venous bleeding; control by direct pressure, pressure points, pressure bandage or tourniquet and by local pressure; tourniquet times; wound dressing;

  Note.— Tourniquets can be dangerous if applied improperly. Limit their use to severe injuries with profuse bleeding that cannot be controlled by pressure.
- convulsions in infants: cause; management, including reassurance to parent;
- cardiopulmonary resuscitation: airway equipment positioning, method;
- choking/obstructed airway: cause and management;
- epilepsy: cause; recognition; management;
- death: recognition; action to be taken; documentation;
- diabetes mellitus: cause and recognition of hypoglycaemic attack; management;
- fainting: cause, recognition; management;
- drug overdose: recognition and management;
- medication in flight: administration, side-effects;
- foreign object in eye: management;
- gastrointestinal troubles; “heartburn”, “hangover”, “gastric upset”, diarrhoea; treatment of each;
- “heart attack” and “angina” (coronary arterial disease): cause, symptoms, recognition; first-aid management of attack;
- high blood pressure (hypertension): cause, symptoms, recognition; management;
- heat emergencies: heat cramps, exhaustion and stroke: cause, recognition and management;
- hypothermia: cause; situations which result in condition, recognition, prevention and management;
- hyperventilation (over-breathing): cause, symptoms, recognition; management;
- hypoxia (may occur at normal operating cabin altitudes in the elderly or passengers with certain diseases): recognition; management;
- motion sickness: causes; management;
- nose bleeding: management;
- pain, undiagnosed: pointers to severity; colicky and non-colicky pain; management;
- seizures: cause and management;
- smoke inhalation: effects, recognition, prevention and management;
- shock: cause; management;

- sick and injured passengers: company regulations; special care;
- “stroke” (cerebral haemorrhage): cause, recognition; management.

h) Artificial respiration:

- recognition of necessity for artificial respiration;
- mouth-to-mouth or mouth-to-nose method, preferably modified by use of an appropriate airway device; A mannequin that simulates human responses should be used for the training;
- the proper technique to administer medical oxygen.

i) Aircraft first-aid and medical kits:

- general knowledge of the location(s) and contents of aircraft first-aid and medical kits and their use;

  Note.— An ability to work from the reference list should be sought rather than memorization of all items. This topic co-ordinates with first-aid demonstrations.

- documentation of first-aid and medical kits.

j) Assistance in medical emergencies:

- procedures for identifying medically qualified persons on board who might assist in medical emergencies;
- level of medical training necessary to be considered qualified (doctor, nurse, technician, etc.);
- In-flight consultation with on-ground medical personnel;
- co-ordination among cabin attendants, flight crew members and on-ground personnel on assistance required both in flight and upon landing.

k) Medical emergency landing:

- conditions warranting medical emergency landing; guidelines; checklist; pilot-in-command’s authority; over-all safety of flight.

CHAPTER 9. RECURRENT TRAINING

9.1 Introduction

9.1.1 All technical skills are transient. Since the most important safety skills are rarely used in day-to-day operation the continuing effectiveness of the cabin attendant has to be ensured through regular periodic exercises simulating, as realistically as possible, emergency situations which may be encountered during flight duty.

9.1.2 Annex 6 to the Convention on International Civil Aviation — *Operation of Aircraft* requires that operators establish and maintain a training programme for cabin attendants to be completed *annually*. The requirement clearly shows the importance put on recurrent training as it emphasizes that the programme should be completed by each crew member at least once in a twelve-month period. The programme shall ensure that the cabin attendants are competent to execute those duties and functions which they are assigned to perform in the event of an in-flight emergency or a situation requiring emergency evacuation.

9.1.3 Recurrent training, therefore, ensures the maintenance of skills of cabin attendants in their safety-related duties and functions and can also serve as a very effective tool for the introduction of and training on new procedures or equipment that may have been introduced since the cabin attendant's last training. Recurrent training also serves to reinforce concepts related to CRM.

9.1.4 Throughout this manual we have been advocating that, as much as can be scheduled, recurrent aircraft cabin-related emergency training for flight crew and cabin attendants be jointly conducted. Several advantages of such a practice have been enumerated. The argument in favour of joint safety training takes into consideration crew members' appreciation of each others' responsibility in the course of managing an emergency situation that may arise in flight, promoting an environment which enables them to operate as one crew complementing each others' efforts. If joint emergency training cannot be performed for any reason, it is recommended that flight crew and cabin attendant instructors observe each others' emergency training and exercise and harmonize training procedures, as required. Instructors should then introduce their acquired knowledge into the recurrent training programme of their respective students.

9.1.5 Some operators have found it useful to provide cabin attendants with a detailed home study on safety and emergency procedures, including a series of questions on the subjects studied to be completed and returned prior to attending recurrent training. Some carriers require students to return the completed home study prior to class commencement. It is then reviewed by the instructor and returned to the student along with an "Answer Key" which the student must use to correct mistakes prior to attending class. If such a procedure is implemented, materials for home study must be provided giving cabin attendants ample time to study the contents. A review of home study highlights should be conducted in class.

9.1.6 Items to be covered during recurrent training, from the training syllabus suggested throughout this manual, have been identified in Table 1-1. Required knowledge, skill and attitude presented in this chapter are reinforcing requirements designed to further emphasize the importance of drills and practical exercise during recurrent training. For recurrent training to be effective and successful, items identified for recurrent training both in Table 1-1 and in this Chapter must be covered in as much detail as possible. Exercises included in Chapter 5 — *Emergency Procedures* and Chapter 7 — *Human Factors* must also be completed during recurrent training.

9.2 Training objectives

Conditions: Simulated presentation of normal, abnormal and emergency situations.

Performance: Cabin attendants will be able to exercise emergency procedures and demonstrate their skill in managing emergency situations that may arise on board an aircraft. They will also be able to practice their skill in the use and operation of emergency equipment required to be carried on board the aircraft they are assigned to serve and review and exercise evacuation procedures.

Standard of accomplishment:
The same standards established for "Initial Training" except if seniority of trainee on cabin crew

requires the performance of different roles (supervise or co-ordinate performance of juniors) in specific situations.

9.3 Required knowledge, skill and attitude

Note.— If cabin attendants' actual duty time includes night operation, it is recommended that part of the practical demonstrations and outdoor exercises practised during recurrent training be performed at night.

- review applicable legal requirements relating to cabin attendant responsibilities during normal and abnormal operations;

- review legal responsibility of cabin attendants in aircraft cabin emergencies; review relevant accident investigation reports and analyze the role of cabin attendants in the findings of the report; review recent cabin safety-related and/or emergency situations which may have occurred on board the operator's aircraft;

- practical demonstration of location, pre-flight check and operation of all fire extinguisher types; demonstration of location, pre-flight check and removal of crash axes; exercise of actual fighting live fire while wearing protective breathing equipment (PBE);

- practical demonstration of location, pre-flight check and operation of portable oxygen equipment; briefing on precautions in use of oxygen;

- demonstrate the location of non-portable oxygen system, by-pass valve, and manual control;

- demonstrate the location and operation of all emergency exits; location, pre-flight check and operation of emergency escape slides;

- practical demonstration of location and operation of all flotation devices;

- practical demonstration on the use of the emergency pack and all signalling apparatus;

- practical demonstration of launching life-raft, inflating life-jackets and boarding life-raft in the water; operation of emergency equipment on board life-rafts;

- review location, pre-flight check and contents of available medical kits on board aircraft; practical demonstration and exercise of first-aid treatment including cardiopulmonary resuscitation; life saving holds; treatment for burns, open fractures, injuries to arteries, etc.;

- actual aircraft evacuation exercise; activation and use of emergency lighting; use of emergency slides (slide training); briefing and marshalling of passengers after emergency landing;

Note.— If actual slide training is not practised for any reason, more time and effort must be spent in training crew members on the most effective ways to speedily and safely evacuate passengers in an emergency. This would include greater emphasis on passenger management, assertiveness, evacuation commands and the physical contact needed to encourage passengers' movement within the cabin and out of the aircraft. In all cases, actual slide training must be performed at least once in twenty-four months. Human Factors and evacuation behaviour should be reviewed.

- review "operations manual" and "aircraft operating manual" requirements on cabin preparation and passenger briefing before emergency landing or ditching;

- review and practice CRM techniques, principles and applications; crew communication during normal and abnormal operations;

- review cabin attendants' duties and responsibilities after emergency landing;

- presentation of instructional films or other audio-visual aids on emergency procedures and survival techniques.