

Democratic Socialist Republic of Sri Lanka



Civil Aviation Authority of Sri Lanka

General Directive

(Issued under Sec. 121, Civil Aviation Act No. 14 of 2010)

Title: Crew Resources Management Training for Flight Crew, Cabin Crewmembers and Flight Dispatchers

Reference No.: CA-GD-2016-OPS S.N. : SLCAGD-001 Date: 18th April 2016

Pursuant to Section 121 of the Civil Aviation Act No.14 of 2010, Director General of Civil Aviation shall have the power to issue, whenever he considers it necessary or appropriate to do so, such General Directives for the purpose of giving effect to any of the provision in the CA Act, any Regulations or Rules made thereunder including the Articles of the Convention on International Civil Aviation which are specified in the Schedule to the CA Act.

Accordingly, I, being the Director General of Civil Aviation do hereby issue the General Directive as mentioned in the Attachment hereto (Ref: CA-GD-2016-OPS-Att-01) , for the purpose of giving effect to the provisions in the aforementioned Act and Standards & Procedures described under Article 37 of the Convention, which are specified in the Attachment.

This General Directive shall be applicable to every person holding an Air Operator Certificate issued by Director General of Civil Aviation and his employees engaged in flight operations and shall come into force with immediate effect and remain in force unless revoked.

Attention is also drawn to sec. 103 of the Act, which states inter alia that failure to comply with General Directive, issued by DGCA is an offence.

H.M.C. Nimalsiri
Director General of Civil Aviation and
Chief Executive Officer

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Enclosure: Attachment No. SLCA-GD-001-Att-01

General Directive

Title: Crew Resources Management Training for Flight Crew, Cabin Crewmembers and Flight Dispatchers

General:

- I. This General Directive outlines the minimum standard for the Crew Resources Training as required by Implementing Standard as amended IS 18, 19 & 21
- II. The requirements contained in this document are applicable to Air Operator Certificate (AOC) holders on International/Domestic Passenger Operations issued by the DGCA.
- III. Holders of Air Operator Certificate (AOC) issued by the DGCA for commercial air transportation shall comply with the requirements published in this document and are hereby instructed to forward to the DGCA a "Declaration of Conformance" which indicates the degree of compliance with each item detailed in the document.
- IV. This document may be amended from time to time and the amendments will be reflected with the vertical line on the left side of the text.

References:

- **IS 18 Flight Crew**
- **IS 19 Flight Dispatchers**
- **IS 21 Cabin Crew**
- **ICAO Doc 9683- Human Factors Training Manual**
- **ICAO Doc 9868 - Procedures for Air Navigation Services- Training**

1. General

The requirement for CRM training is multifunctional. It is not “one cure for safety” but another tool to be used as a mitigate to safety hazards. Its ultimate goal is to achieve, safety in operations, whilst using the resources in and around aviation circle.

When an organization has not clearly defined its safety objectives, they tend to rely excessively on external sources to discharge them. i.e. Regulatory Authority, Regulations, Advisory Circulars etc.

Regulatory compliance alone will not be a tool to be used to achieve safety in operations. Airline operators must bear in mind that regulations usually represent minimum levels and that regulations cannot cover all risks involved in aviation, as each incident is unique in its own way.

Furthermore, if regulations are formally applied, but the sense of them is lost, the original reason for introducing them is quickly forgotten, it follows that legislation is, as its best, a limited way of affecting human behavior.

The General Directive on CRM should be looked at, as a tool to enhance safety in operations and the operator is advised to use the following details when submitting the training programme on CRM for approval.

2. Applicability:

Applicable between Flight crew & Flight crew, Cabin crew and Cabin crew and between Flight crew and Cabin crew and Flight Dispatchers.

3. Abbreviations

- CRM Crew Resources Management
- LOFT Line Orientated Flight Training
- SA Situational Awareness

4. Objective: The Objectives of CRM training are as follows:

- a) To enhance crew and management awareness of human factors which could cause or aggravate incidents which affect the safe conduct of air operations.
- b) To enhance knowledge of human factors and develop CRM skills & attitudes, which when applied appropriately, could remove an aircraft operation from emerging accidents & incidents, whether effected by technical or human factor failures.
- c) To use CRM knowledge, skills & attitudes to conduct and manage aircraft operations, and fully integrate these techniques throughout every facet of the organization culture, so as to prevent the onset of incidents and potential accidents.
- d) To use the skills, to integrate commercially efficient aircraft operations, with safety.
- e) To improve the working environment for crews and all those associated with aircraft operations.
- f) To enhance the prevention & management of crew error.

5. Introduction to CRM Principles

5.1 Crew Resources Management training originated from a NASA workshop in 1979 that focused on improving air safety. The NASA research presented at a meeting found that the primary cause of the majority of aviation accidents was Human Error and that main problems were failures of:

- i. Interpersonal Communication
- ii. Leadership and
- iii. Decision Making

5.2 CRM training encompasses a wide range of knowledge, skills and attitudes including communications, situational awareness, problem solving, decision making and team work.

- 5.3** CRM can be defined as a management system which makes optimum use of all available resources – People, Equipment & Procedures - to promote safety & enhance the efficiency of flight operations.
- 5.4** CRM is concerned not so much with the technical knowledge & skills required to fly and operate an aircraft, but rather with the cognitive and interpersonal skills needed to manage the flight within an organized aviation system.
- 5.5** CRM programme to be successful, it must be embedded into all type of training & it must be continuously reinforced & must become an integral part of the organization culture. CRM should thus be instituted as a regular part of periodical training and should include practice and feedback exercises such as complete crew LOFT exercises.
- 5.6** LOFT is considered to be an equally important part of CRM training, where the philosophy of CRM is reinforced, as LOFT involves a full mission of simulation of situations which are representative of line operations, with emphasis on CRM principals of Communication, Management & Leadership. LOFT is considered a practical training for CRM application.
- 5.7** The following are the Skills which are essentials for CRM training:
- 5.7.1** Human Factors: human factors means anything & everything to do with people.
- i. Human beings and their work environment
 - ii. Human beings and technology
 - iii. Human beings and procedures stress
 - iv. Human beings and the environment
 - v. Human beings and human beings
- Human performance is defined as the human capabilities and limitations which have an impact on the safety and efficiency of aircraft operations.
 - Human performance training, focuses on relationships between people & equipment, systems, procedures and the environment, as well as personal relationships between individuals and groups. It encompasses the overall performance of cabin crew members while they carry out their duties.
 - The goal of this training is to optimize human performance and manage human error. It encompasses Human Factors principles, crew resource management and the development & application of skills, such as decision-making. Human performance training should be oriented towards recognizing and solving practical problems.
 - The SHELL model is an essential component to be used for Human Factors module. It explains the relationship between individuals and their operational environment. (Further guidance may be found in ICAO - Safety Management Manual - doc 9859, Human Factors Training Manual - doc 9683, Human Factors Digest No 15: Human factors in Cabin Safety (Cir 300)

5.7.2 Threat & Error Management (TEM)

To err is human is an old age saying. Each of the interfaces in the SHELL model has a potential of error which could become a mismatch between its components.

- The interface between Live-ware & Hardware is a frequent source of error (human & Machine).
- Between Live-ware & Software, delays & errors may occur while seeking vital information from confusing, misleading or excessively clutter documentation & charts.
- Errors associated with Live-ware & Environment interface may be caused by environmental factors (noise, heat, lighting and vibration). It too may be caused by the biological rhythms in irregular working/sleeping patterns.
- In Live-ware- Live-ware interface, the focus is on the interaction between people because this affects crew effectiveness. This includes leadership & command for operational efficiency.

Error management is a systems approach to aviation safety, originally developed by human factors researchers at the University of Texas. Embraced by airlines worldwide and recognized as an international best practice, by among others, the TEM offers an intuitive and flexible approach to practical risk management. TEM not only offers a framework for understanding and directing human performance in complex operating environments, it also provides aviation professionals — regardless of their organizational function or status — a risk management lexicon that supports a positive safety culture . It is pertinent to remember that risk comes from both expected and unexpected threats & hence CRM principles must prepare the crewmember to mitigate all kinds of threats.

5.7.3 Communication Skills:

Effective communication, which includes all transfer of information, is essential for safe operation of aircraft. Communication may be by speech, by the written word, by non-verbal means as gestures & body language or by a variety of symbols & displays.

Effective communication is the basis of successful teamwork. Barriers to communication are explained, such as cultural difference, rank, age, crew position and working attitude. Flight crew are encouraged to overcome such barriers through self- esteem, participation, polite assertiveness.

During this module, identifying the hazards which reduces the quality of communication in the operational environment, will no doubt make communication skills more effective. It is a task, of Human Factors training to prevent communication errors. Reinforcing “English” as the common language, will ensure error-free transmission of messages & interpretation.

It is necessary to keep in mind that ambiguous, misleading, inappropriate or poorly constructed communication, combined with expectancy, have been listed as elements of many accidents, the most notorious one being the double B 747 disaster in Tenerife (March 1977).

5.7.4 Cognitive Skills:

Cognitive skills are important and is defined as the mental processes used for gaining & maintaining situational awareness, for solving problems and for decision making. Evidence from field studies in automation indicates that pilots are also concerned about the degradation in their cognitive (mental) skills due to the ease of navigation and maintenance of situational awareness using electronic maps.

Cognitive skills are important for decision making during emergency situations. Moreover Cognitive skills are needed to manage the flight within an organized aviation system in normal situations as well.

Interpersonal skills are regarded as communications and a range of behavioral activities associated with teamwork. In aviation, as in other walks of life, these skill areas often overlap with each other, and they also overlap with the required technical skills.

5.7.5 Situational Awareness:

Situational Awareness (SA) is "knowing what is going on around you" and is fundamental to correct decision making and action. Total awareness is knowing what is going on around you, the big picture and its fundamentals to correct decisions making & actions.

Information processing tend to be based on perceived & processed information.

Situational Awareness is more than just perception. It is understanding of what you perceive, how it may change in the future & the implications. Decision making is based on situational awareness, therefore if you have poor SA you are likely to make poor decisions.

SA has been referred to as perception of reality and it is quite possible for different crew members to have different perceptions of reality. The SA training should be to ensure that all Flight Crew have a good SA a common (& correct) perception of the state of the aircraft & environment.

This could be achieved by team work & communication. Break down of SA is the root cause of so many incidents, and eliminating it, would dramatically reduce accident rates, hence SA is an essential element of CRM.

5.7.6 Problem Solving, Decision Making and Judgment;

These three topics are very broad and interrelate to a great extent with each other as well as with other areas. During an emergency situation, information may or is requested and offered. This may lead to conflicts due to differences of opinion and the skill to resolve conflict therefore is essential and appropriate. The skill, aims at developing conflict management within a time constraint. A conflict could be immediate or on going, it could require a direct resource or certain tact to cope with it. By developing flight crew judgment within a certain time frame, it would develop skills, to resolve conflicts.

5.7.7 Leadership:

A leader is a person whose ideas & actions influence the thought and behavior of others. Leadership involves teamwork and the quality of a leader depends on the success of the leader's relationship with the team.

Leadership & Managerial skills help to achieve joint task completion within a motivated & a fully functional team through coordination & persuasiveness. The use of authority & assertiveness infers the ability to create a proper challenge & response atmosphere. The command authority of the PIC should be adequately balanced by assertiveness of crew member participation. This command authority must be acknowledged by the crew at all times and it is vital for PIC to know & note that the effectiveness of the command role cannot be assumed by position alone but by his behavior as well. If & when situations arise, decisive actions are expected.

Leadership skills should be developed for all, through proper training. Such training in aircraft operations is necessary as young crew are now holding command positions and aircraft accidents & incident investigations have demonstrated that personality differences influence the behavior & performance of crewmembers.

5.7.8 Stress Management:

Stress is an inescapable part of life for all. Any force, that when applied to a system causes a significant of its form to where forces can be physical, psychological or into social pressures. From a human view point stress results from the imposition of any demand or set of demands which requires to react, adopt or behave in a particular manner in order to cope with or satisfy them. Up to a point such demands are stimulating & useful, but if the demands are beyond our personal capacity to deal with them, resulting stress is a problem.

Any kind of emergency situations will always bring about stress. It is essential to remember that a crewmember may bring both physical and mental stress by virtue of the job and the element of fatigue too will add to it. Stress Management is about recognizing those elements, dealing with one's stress & help others manage their own. It is only by accepting things that are beyond control, changing things that can, & knowing the difference between both, that can safely efficiently manage stress.

5.7.9 Assess & Analysis:

Discussion of cases and learning to comment and assess & analyze actions are both ways to improve one's knowledge, skills & understanding. Review of individual airlines accidents & incidents to create problem solving dilemmas that should act-out and analyze through the use of feedback system will enhance crewmember awareness of their surrounding environment, make them recognize and deal with similar problems and help them solve situations that might occur to them,

Note: The above skills are not confined to multi-crew aircraft, but also relate to single pilot operations which invariably need to interface with other aircraft and with various ground support agencies, in order to complete their missions successfully.

5.8 During an accident or incident investigation, the objective is to find “what” rather than “who” is wrong. The training, SOPs, company administration, Management commitment

and working conditions with the operator may be contributory factor/s. The operational personnel are part of an organization and their actions and attitudes may reflect who employs them. Hence the organization need to have the objectives in line with safety as its primary goal and not as a supporting role. Their production objective should be “without harm to human life” or “property damage”.

5.9 As there’s an element of risk in aviation which may not be completely eliminated, it can be successfully controlled through risk management programmes. CRM training is no doubt a tool for risk management.

5.10 Corporate culture is as relevant to organizational performance is to human behavior. Culture like personality, involves deep seated traits and it is extremely resistant to change. By identifying what constitutes a good safety oriented airline, the management may change and improve the existing corporate culture by setting examples which are consistent with safety value systems. A safety culture in an organization shall have a set of beliefs, norms, attitudes, roles, responsibilities & accountabilities in minimizing the exposure of conditions which are considered dangerous or hazardous.

5.11 The characteristics which define a safe culture is inclusive of the following but not limited to:

- The management places a strong emphasis on safety as a strategy of controlling risks;
- They implement measures to contain the consequences of identified safety deficiencies;
- They foster a climate in which there is positive attitude towards information regarding safety sensitive concerns, criticisms, comments and feedback from other levels of the organization;
- They do not use their influence to force their views or to avoid safety criticisms;
- They train the personnel to fully understand the consequences of unsafe acts; and
- There’s non punitive reporting system.

5.12 The traits of a safe organization is inclusive of the following but not limited to;

- They pursue safety as one of the prime objectives and regard safety as a major contributor in achieving production goals;
- Has developed appropriate risk management structures, which allow for an appropriate balance between production management and risk management;
- Enjoy an open, good and healthy safety corporate culture;
- Possess a structure which has been designed with a suitable degree of complexity, standardized procedures and centralized decision making consistent with the objectives and the characteristics of the environment in the organization;
- Rely on internal responsibility rather than regulatory compliance to achieve safety objectives; and
- Respond to observed safety deficiencies with long term measures in response to latent failures as well as short term, localized actions in response to active failures.

6 CRM TRAINING & EVALUATION

6.1 The success of any CRM training program ultimately depends on the skills of the people who administer the training and measure its effects. CRM instructors check pilots,

supervisors, and course designers must be skilled in all areas related to the practice and assessment of CRM. These skills comprise an additional level to those associated with traditional flight instruction and checking. Gaining proficiency and confidence in CRM instruction, observation, and measurement requires special training for instructors, supervisors, and check pilots in many CRM training processes. Instructors, supervisors, and check pilots need special training in order to calibrate and standardize their own skills. The best results occur when the crews examine their own behavior with the assistance of a trained instructor who can point out both positive and negative CRM performance. Whenever highly effective examples of crew coordination are observed, it is vital that these positive behaviors be discussed and reinforced. Debriefing and critiquing skills are important tools for instructors, supervisors, and check pilots.

- 6.2** Feedback from instructors, supervisors, and check pilot is most effective when it refers to the concepts that are covered in the initial indoctrination/awareness training. The best feedback refers to instances of specific behavior, rather than behavior in general.

7 CRM evaluation

- 7.1** Any human factors program should include appropriate evaluation criteria as an integral component. Detailed behavioral measurement is integral to any evaluation, since it is the best index of how individuals apply what they have learned. Behavioral measurement requires the development of objective behavioral markers, which can be externally judged and are relevant to the operating environment. Behavioral markers can be measured both during training as a marker of progress, and subsequently as an indicator of how well training has transferred.

- 7.2** The flight crew must be assessed on their CRM skills in accordance with a methodology acceptable to the Authority and published in the Operations Manual. The purpose of such assessment is to provide feedback to the crew collectively and individually and serve to identify retraining. The assessment can also be used to improve the CRM training system.

8 Appropriate Training Interventions

- 8.1** The most effective CRM training involves active participation of all crew members. LOFT sessions give each crew member opportunities to practice CRM skills through interactions with other crew members. If the training is videotaped, feedback based on crew members' actual behavior, during the LOFT, provides valuable documentation for the LOFT debrief.

- 8.2** CRM training can be presented using a combination of the following training interventions:

- (1) Operator in-house courses.
- (2) Training center courses.
- (3) Special Purpose Operational Training.
- (4) LOFT sessions.
- (5) Computer Based Training courses.

9 CRM Instructors (CRMI)

9.1 Flight Crew Instructor Qualifications. (As a minimum)

- has followed a “Train the Trainer “programme acceptable to CAASL & shall have the necessary instructional skills & attitude.
- Have or had a Commercial air transport experience as a flight crewmember.
- shall be an ATPL License Holder.
- shall have completed Initial & Recurrent CRM training.
- has successfully passed Human Performance Limitations (HPL) examination whilst obtaining ATPL, if it is within 3 years.
- has theoretical knowledge on the CRM subject & training requirements.
- should be a role model who has practiced CRM during his career as a pilot.
- shall have the ability in developing training programmes.
- Able to evaluate, assess & facilitate constructive debrief of CRM issues to trainees.

9.2 Cabin Crew Instructor Qualifications. (As a minimum)

- has followed a “Train the Trainer “programme acceptable to CAASL & shall have the necessary instructional skills & attitude.
- It is desirable for a pilot license holder who has experience as a flight crewmember in a commercial airline to conduct CRM for cabin crew but should be aware of the roles and responsibilities of a cabin crew.
- Have suitable experience of commercial air transport as a cabin crew member and who has been working as a supervisor. (Purser, Leading etc.)
- have completed an Introductory CRM Course and the Operator’s CRM training;
- have received instructions in training skills in order to conduct CRM courses;
- be supervised by suitably qualified CRM instructors when conducting their first CRM training course.
- should be a role model who has practiced CRM during his career as a cabin crew.
- shall have the ability in developing training programmes
- Able to evaluate, assess & facilitate constructive debrief of CRM issues to trainees.

10. CRM training Syllabus for Flight crew

Core Element (a)	Initial CRM Training (b)	Operator’s conversion courses (c)	Operator’s Conversion Course When Changing Operator (d)	Command Course (e)	Recurrent Training (f)
1. Human Error & reliability, error chain, error prevention & Detection	In depth	In depth	Overview	overview	overview
2. Company Safety Culture,		Not required	In depth	In depth	

SOP's, Organizational Factors	In Depth				
3. Stress, stress management, fatigue & vigilant			Not required		
4. information acquisition & Processing, situational Awareness, workload Management		Over view			
5. Decision making					
6. Communicati on & coordination inside & outside flight deck			overview		
7. Leadership & team behavior synergy					
8. Automation, philosophy of the use of automation, if relevant to the type		In depth	In depth	As required	As required
9. Specific type related differences		In depth	Not required	As required	As required
10. Case base studies		In depth	In depth	In depth	

10.1 CRM training Syllabus for Cabin crew

Training Elements	Introductory CRM Course	Operator's CRM Training	Aeroplane Type Specific	Annual Recurrent CRM Training	Senior Cabin Crew Course
Human factors in aviation General instructions on CRM principles and objectives					Overview

Human performance and limitations				Not required	
From the perspective of the individual cabin crew member					
Personality awareness, human error and reliability, attitudes and behaviors, self-assessment	In depth	Not required	Not required	Overview	Not required
Stress and stress management					
Fatigue and vigilance					
Assertiveness					
Situation awareness, information acquisition and processing					
From the perspective of the whole aeroplane crew					
Error prevention and detection Overview	Not required	In depth	Relevant to the type(s)		Reinforcement (relevant to the Senior cabin crew duties)
Shared situation awareness, information acquisition and processing					
Workload management					
Effective communication and coordination between all crew members including the flight crew as well as inexperienced cabin crew members cultural differences					

Leadership, co-operation, synergy					
Individual and team responsibilities, decision making, and actions					
Identification and management of the passenger human factors : crowd control, passenger stress, conflict management, medical factors					
Specifics related to aeroplane types (narrow/wide bodies, single/multi deck), flight crew and cabin crew composition and number of passengers					
From the perspective of the operator and the organization					
Company safety culture, SOPs, organizational factors, factors linked to the type of operations	Not required	In depth	Relevant to the type(s)	Overview (3 year cycle)	Reinforcement (relevant to the Senior cabin crew duties)
Effective communication and coordination with other operational personnel and ground services					
Participation in cabin safety incident and accident reporting					
Case based studies (see note)					

11. RECURRENT CRM TRAINING

CRM training must be included as a regular part of the recurrent training requirement. Recurrent CRM training should include modular classroom or briefing room CRM training to review and amplify CRM components, followed by practice and feedback exercises. All major topics of CRM training shall be covered over a period not exceeding 3 years.

CRM elements should be integrated into all the phases of the recurrent training – by all the personnel conducting recurrent training. The operator shall ensure that all personnel conducting recurrent training are suitably qualified to integrate elements of CRM into this training.