



ICAO

Doc 10206

Manual on Aircraft Accident and Incident Investigation Training

First Edition, 2024



Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION



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FOREWORD

The investigation of an aircraft accident or incident is a wide-scope activity. Therefore, some investigations will be curtailed by the resources available, unless proper management of the investigation is exercised. The investigator-in-charge is responsible for ensuring that an investigation extracts the maximum benefit for the safety of aviation within the constraints of the resources available. The investigator-in-charge must have the experience to direct the investigation in a manner that ensures that resources are used to the maximum effect and not misspent on irrelevant lines of investigation. At the same time, the investigator-in-charge must also ensure, as much as is practicable, that relevant lines of investigation are terminated as soon as they have achieved the level beyond which further expenditure of resources would not be significantly beneficial for the enhancement of safety.

As experience is gained, the investigator will realize that there is a continual need to increase knowledge and upgrade skills. While training is essential, the optimization of an investigator's capabilities generally depends on a personal commitment to excellence.

ICAO has developed training guidelines in this area, which are contained in Circular 298 – *Training Guidelines for Aircraft Accident Investigators*. The circular discusses the experience and employment background required for training as an aircraft accident investigator. It also outlines the progressive training necessary to qualify a person for the various investigation roles, including appointment as the investigator-in-charge of an investigation into a major accident involving a large transport-category aircraft. ICAO acknowledges that training guidelines are evolutionary in nature and need to be updated periodically.

During the second meeting of the Accident Investigation Panel (AIGP/2) held in Montréal in June 2016, it was concluded that, although basic investigator training at formal institutions was well structured, it was not comprehensive enough to prepare investigators to perform adequately in the field. Training programmes would need to be designed to address areas of deficiency, and Final Reports could be used to identify investigators' deficiencies.

At the AIGP/2, it was agreed that competency-based training (CBT) would be a training methodology defining the competencies of aircraft accident and incident investigators, and that such training should not be prescriptive so as to allow States to implement CBT as appropriate.

During further discussions held at the sixth meeting of the Accident Investigation Panel (AIGP/6), held in Montréal from 10 to 21 May 2021, it was acknowledged that applying a full range of competency-based training and assessment methodologies would not be suitable for the function of an aircraft accident investigator, and that high-level guidance for an adapted CBT model would be more appropriate and useful for States' accident investigation authorities, which, based on their size and resources, could then determine how to apply the methodology.

This manual supersedes Cir 298 in its entirety. It includes updated and expanded guidance as well as an adapted CBT model for accident and incident investigators.

The following ICAO documents provide additional information and guidance on related subjects:

- *Annex 13 – Aircraft Accident and Incident Investigation*
- *Manual of Aircraft Accident and Incident Investigation (Doc 9756)*

Part I – *Organization and Planning*

Part II – Procedures and Checklists

Part III – Investigation

Part IV – Reporting

- *Manual on Accident and Incident Investigation Policies and Procedures (Doc 9962)*
- *Manual on Regional Accident and Incident Investigation Organization (Doc 9946)*

ICAO is grateful for the considerable assistance provided by the Accident Investigation Panel in the preparation of this manual.

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GLOSSARY

When the following terms are used in this manual, they have the following meaning:

Accident investigation authority. The authority designated by a State as responsible for aircraft accident and incident investigations within the context of Annex 13.

Accident investigator. A person engaged in the investigation of aircraft accidents, incidents and other aviation safety hazards.

Accredited representative. A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State. The accredited representative would normally be from the State's accident investigation authority.

Adviser. A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

Competency. A dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviours that mobilize the relevant knowledge, skills, and attitudes to carry out activities or tasks under specified conditions.

Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

Competency standard. A level of performance that is defined as acceptable when assessing whether or not competency has been achieved.

Expert/specialist. A person invited to participate in an investigation, on the basis of his or her specialized knowledge, skills or experience.

Global positioning system (GPS). The satellite navigation system operated by the United States.

ICAO competency framework. A competency framework, developed by ICAO, is a selected group of competencies for a given aviation discipline. Each competency has an associated description and observable behaviours.

Investigation. A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and/or contributing factors and, when appropriate, the making of safety recommendations.

Investigation management system. A systematic approach to managing an investigation, based on a comprehensive plan, checklists, and method and flow charts to track the progress of the investigation.

Investigator-in-charge. A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Note.— Nothing in the above definition is intended to preclude the functions of an investigator-in-charge being assigned to a commission or other body.

Observer. A person permitted to be present in an investigation for the purpose of observing the investigation process.

On-the-job training. Training carried out under working conditions and with guidance from a supervisor or a highly-experienced operator during which the trainee can reinforce skills achieved during formal training and/or acquire new skills while actually practising them in real time.

State of Design. The State having jurisdiction over the organization responsible for the type design.

State of Manufacture. The State having jurisdiction over the organization responsible for the final assembly of the aircraft, engine or propeller.

ABBREVIATIONS AND ACRONYMS

AIGP	Accident Investigation Panel
CAA	Civil Aviation Authority
CBT	Competency-based training
EGPWS	Enhanced ground proximity warning system
GPS	Global positioning system
OJT	On-the-job training
RPA	Remotely piloted aircraft
RPAS	Remotely piloted aircraft system
RPS	Remote pilot station
SARPs	Standards and Recommended Practices
SMS	Safety management system

CHAPTER 1

BACKGROUND EXPERIENCE FOR INVESTIGATORS

1.1 Aircraft accident investigation is a specialized task that should only be undertaken by qualified investigators. Many States establish an accident investigation authority operated by qualified and experienced investigators. Some States have both an independent accident investigation authority and an accident investigation unit within the regulatory authority. Others may still rely on investigation by the regulatory authority alone, which would be in violation of Standard 3.2 of Annex 13 – *Aircraft Accident and Incident Investigation*, which requires that a State establish an accident investigation authority that is independent from aviation authorities and any other entities that could interfere with the conduct or objectivity of an investigation. Some States do not have any personnel employed solely for aircraft accident investigation. Such States should train appropriately qualified personnel in the accident investigation techniques required to participate in, or conduct, an aircraft accident investigation. When assigned to an accident investigation, such personnel should be relieved of their regular duties for the duration of the investigation.

1.2 Potential accident investigators must have considerable practical experience in aviation as a foundation on which to build their investigation skills. This experience can be acquired by individuals with civil or military qualifications as a pilot, aeronautical engineer or aircraft maintenance engineer. Personnel qualified in flight operations, airworthiness, air traffic management or aviation-related management may also be suitable for accident investigator training. Since accident investigations often involve specialized areas, those selected for training as investigators must understand the aviation infrastructure and be able to relate to the many different areas of aviation.

1.3 Normally, a small team or even a single investigator may be designated to conduct the investigation of an accident involving a general aviation or small commuter aircraft. In these investigations, it is desirable for an operations investigator to have some technical experience and for an engineering investigator to have some experience as a pilot. In addition, the investigators should have a comprehensive understanding of the relationship between each of the supporting services that are necessary to operate an aircraft in the aviation environment.

1.4 Since the outcome of an accident investigation largely depends on the aviation knowledge, skills, attitudes and experience of the assigned aircraft accident investigators, these individuals should possess:

- a) an understanding of the depth of investigation that is necessary in order for the investigation to conform to the legislation, regulations and other requirements of the State in which they are conducting the investigation;
- b) an understanding of the responsibilities of the States involved in the investigation, as prescribed in Annex 13;
- c) knowledge of aircraft accident investigation techniques;
- d) an understanding of aircraft operations and the relevant technical areas of aviation;
- e) the ability to obtain and manage the relevant technical assistance and resources required to support the investigation;
- f) the ability to collect, document and preserve evidence;

- g) the ability to identify and analyse pertinent evidence in order to determine the causes and/or contributing factors and, when appropriate, make safety recommendations; and
- h) the ability to write a Final Report that meets the requirements of the accident investigation authority of the State conducting the investigation and the requirements of Annex 13.

1.5 In addition to technical skills and experience, an accident investigator requires certain personal attributes. These attributes include integrity and impartiality in the recording of facts; the ability to analyse facts in a logical manner; perseverance in pursuing investigations, often under difficult or trying conditions; and tact in dealing with a wide range of people who have been involved in the traumatic experience of an aircraft accident.

CHAPTER 2

TRAINING GUIDELINES

2.1 GENERAL

2.1.1 Aircraft accident investigators require different levels of experience, knowledge and training according to the particular role to which they are assigned. Aircraft accident investigators should receive training commensurate with their responsibilities as an accident investigator, group leader, investigator-in-charge, accredited representative, adviser or expert/specialist. The training guidelines and course syllabuses should be formalized in an investigation training programme and should be planned in such a way that the investigators receive appropriate levels of training that will enable them to perform efficiently in any of the roles assigned to them by the respective State's accident investigation authority.

2.1.2 Training a person for aircraft accident investigation involves two main phases: a basic accident investigation training and advanced accident investigation training. These phases include familiarization, initial formal training, on-the-job training (OJT) and an advanced formal training supplemented by specialty training. Investigators should be afforded with recurrent training, as necessary and at the discretion of the accident investigation authority.

2.1.3 While OJT is a process that continues for many years, there should be sufficient time intervals between each formal course to allow the investigator to consolidate the information and techniques learned.

2.1.4 Formal courses are designed to complement OJT by exposing trainee investigators to a cadre of experts who can share the details of their specialities and investigation experience with the trainee investigators. The experts recruited are usually those with experience in a particular area of investigation. They include experienced investigators, pilots, aviation medicine physicians, psychologists, aeronautical engineers and manufacturers' representatives.

2.1.5 In some States, structured courses in aircraft accident investigation are provided by universities, manufacturers, military establishments or other educational institutions. In such cases, it is necessary for the accident investigation authority to validate the content of the course to ensure that it complies with the authority's accident investigation training programme.

2.1.6 ICAO does not endorse specific courses or educational institutions that offer aircraft accident investigation training. However, it does provide information on institutions that offer aircraft accident investigation courses,¹ including through its Aviation Training Directory.

2.2 PHASE 1 – BASIC ACCIDENT INVESTIGATION TRAINING

2.2.1 Familiarization

The aim of this initial training is to familiarize new investigators with their State's accident investigation system, providing an overall view of the legislation and the procedures and requirements of the accident investigation authority. Table 2-1 lists the topics to be included in the initial training.

¹ <https://igat.icao.int/ated/TrainingCatalogue>

Table 2-1. Initial training topics

INITIAL TRAINING TOPICS	
Administrative arrangements	<ul style="list-style-type: none"> • Applicable legislation • Annex 13 – <i>Aircraft Accident and Incident Investigation</i> • International agreements • Memorandums of understanding with other organizations • Liaison arrangements with local and national authorities • Structure of the State’s accident investigation authority • Aircraft accident investigation manuals and procedures • Definitions and occurrence classification • Equipment and tools • Transport arrangements • Ethics and conduct • Expenditure control
Initial response procedures	<ul style="list-style-type: none"> • On-call procedures • Notification to other national authorities and organizations • Securing of records, recordings and samples • Accident site jurisdiction and security • Personal safety including psychological stress • Hazards at the accident site • Recovery of human remains • Requests for autopsies • Assistance to aircraft accident victims and their families
Investigation procedures	<ul style="list-style-type: none"> • Authority and responsibility • Size and scope of the investigation • Investigation management • Use of specialists • Parties to the investigation, accredited representatives, advisers, experts and observers • Release of information to the news media

2.2.2 Initial formal training

After completing the initial familiarization training, the aircraft accident investigator should attend an initial basic accident investigation course as soon as is practicable, preferably within the first year of training. A basic accident investigation course should have a syllabus that includes the subjects discussed in Chapter 3.

2.2.3 On-the-job training

Following the initial formal training, an accident investigation authority should provide OJT for a new investigator, allowing theory to be put into practice. During this training, the new investigator will practice the procedures and tasks covered under familiarization and the initial formal training, and gain familiarity with investigation procedures, methodologies and techniques. This training will also allow the investigator to become familiar with the investigation tasks at the accident site, the collection of factual information, the analysis of the factual information and the development of the Final Report. The conduct of OJT often involves more than one experienced investigator and is not limited to investigations within the State

that employs the trainee/investigator. The accident investigation authority's accident investigation training programme should specify the content to be practiced in each of the OJT sessions, as well as the level of performance expected to be achieved by the trainee.

2.3 PHASE 2 – ADVANCED ACCIDENT INVESTIGATION TRAINING

2.3.1 Advanced formal training

2.3.1.1 As experience is gained, a trained investigator should be enrolled in an advanced accident investigation course so that knowledge of basic techniques and in special areas relevant to accident investigations can be enhanced.

2.3.1.2 In general, an advanced accident investigation course prepares an investigator for the responsibilities of an investigator-in-charge or group leader of a major investigation. This course should aim to provide the investigator with an understanding of, and some competency in, the organization and management of a major accident investigation.

2.3.1.3 An advanced accident investigation course should have a syllabus that includes the subjects outlined in Chapter 3.

2.3.2 Specialty training

This training may be introduced at any stage following an initial accident investigation course. Specialty courses enhance the competencies acquired by the investigator to meet the needs of a particular investigation area, method, technique or technology that is relevant to the functions assigned. Chapter 3 provides some investigation areas and topics that could be addressed through specialty training.

2.4 CONTINUATION TRAINING

The accident investigation authority should establish continuation training to maintain competencies throughout the investigator's career. Such training should cover competencies that need to be refreshed periodically and competencies developed in response to the accident investigation authority's management of change, such as the implementation of new investigation rules, new regulations in aviation safety, methodology and techniques, or the introduction of new aviation technology or equipment.

2.5 ADDITIONAL TRAINING

2.5.1 Investigators may be called upon to investigate accidents involving a variety of aircraft types. It is impracticable to train an investigator on each of the aircraft types met. Nevertheless, investigators should have a basic knowledge of most of the major air transport aircraft types that are operated in their State. It is therefore recommended that investigators attend aircraft familiarization courses on the most common aircraft types used by the airlines in their State. Preferably, such familiarization courses should include specialized technology transport-category aircraft (for example, aircraft equipped with a glass cockpit, fly-by-wire systems and aircraft that contain composite materials in their structure). There is no need for each investigator to attend type courses on all the large aircraft types used in their State; rather, training on the various aircraft types can be shared equitably among the investigators. For example, one investigator could be trained on one or two large aircraft types and another investigator on other aircraft types. Investigators

with a technical or engineering background could attend the aircraft type courses for technical/maintenance personnel. Similarly, investigators with a pilot background could attend the aircraft type courses for pilots, which could include introductory flight training in a flight simulator.

2.5.2 In accordance with Annex 13, the State of Design and the State of Manufacture are entitled to participate through designated accredited representatives in investigations involving the type of aircraft that are designed or manufactured in their State, respectively. Although the accredited representatives of the State of Design and the State of Manufacture are usually accompanied by specialist advisers from the designer organization and the manufacturer, it is essential that these accredited representatives have a basic knowledge of the aircraft designed or manufactured in their State.

2.5.3 Additional training can be obtained by attending conferences and seminars conducted by aircraft accident investigation organizations, accident investigation training institutions and aviation-related entities such as the International Society of Air Safety Investigators, and by reading related material such as Final Reports issued by other States.

2.5.4 Investigators can acquire meaningful training through exposure as observers to investigations conducted by other States. To this end, States' accident investigation authorities are highly encouraged to cooperate in the investigation of accidents and to allow investigators seeking relevant experience to attend those investigations.²

² *Assembly Resolutions in Force (as of 7 October 2022) (Doc 10184), Assembly Resolution A41-10 – Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation, Appendix N – Cooperation among Member States in investigations of aircraft accidents.*

CHAPTER 3

ACCIDENT INVESTIGATION COURSE GUIDELINES

3.1 BASIC ACCIDENT INVESTIGATION COURSE

3.1.1 Recommended topics

Basic aircraft accident investigation courses should cover, at a minimum, the following topics:

- a) the responsibilities of the States involved, as defined in Annex 13 – *Aircraft Accident and Incident Investigation*;
- b) the accident site considerations, such as security, hazards, safety precautions, wreckage diagramming, collection of evidence and control of access;
- c) the investigators' personal equipment and protective clothing;
- d) the examination and recording of the wreckage and witness marks;
- e) the range of apparatus available for recording evidence;
- f) interview techniques;
- g) in-flight recorders and ground-based recorders;
- h) protection of accident and incident investigation records;
- i) the determination of the time and origin of any aircraft fires;
- j) crashworthiness and survival aspects;
- k) the properties and the modes of failure of materials used in the aircraft structure;
- l) the design of aircraft systems and likely modes of failure;
- m) aerodynamics and aircraft performance;
- n) the examination of power plants;
- o) human performance;
- p) aviation medicine and pathology;
- q) the methodology for report writing and making safety recommendations; and

- r) accident prevention measures including occurrences classification, categorization, and database and preventive actions.

3.1.2 Detailed breakdown of the topics that should be covered

General introduction

3.1.2.1 The first phase of a course should introduce the investigator to the history of aircraft accident investigation, the development of the international agreements on the conduct of investigations, and the Standards and Recommended Practices (SARPs) adopted by ICAO and its Member States in the field of aircraft accident and incident investigation. The applicable international SARPs are contained in Annex 13. Relevant guidance is provided in the *Manual of Aircraft Accident and Incident Investigation* (Doc 9756) and *Manual on Accident and Incident Investigation Policies and Procedures* (Doc 9962). A review of these documents and their salient points is required so that the investigator knows where to find the information on the relevant topics. General guidance should also be given on the investigation of accidents involving unlawful interference, both civil and military aircraft or facilities, and inaccessible or missing aircraft.

Notification procedures

3.1.2.2 The investigator should be introduced to the occurrence notification systems and the appropriate responses to be expected from each State and organization that is notified. This introduction should cover the ways in which the notification of the occurrence of an accident or serious incident initiates the process of an investigation. It should also cover the support to be provided to the accident investigation authority in the State of Occurrence by the State of Registry, the State of the Operator, the State of Design, the State of Manufacture, and any other States that are involved by virtue of the number of their nationals involved in the accident or that are involved by providing a permanent base for the investigation due to their proximity to an accident site. Accident investigators should be made aware of the requirements of Annex 13 in relation to this phase of an investigation. Preparation for overseas travel in the form of passports and visas and airport airside passes should be reviewed, as should the benefits of access provided for by the SARPs in Annex 9 – *Facilitation*.

Investigation management

3.1.2.3 The introduction should cover the role of the investigator, the skills to be acquired and the accident investigation process. The value of assessing the availability of resources (such as funding, personnel, equipment and buildings) should be disclosed as well as the planning for the investigation of a major accident beforehand. The investigator should be given guidelines for determining the appropriate size and scope of an investigation, the differences between the management of large and small investigations, and the type of circumstances in which assistance from specialists will contribute to the success of the investigation. To this end, it is recommended that simulation exercises based on real accidents be provided to investigators. Mock exercises should enable participants to review the main elements of setting up an investigation as well as to establish and coordinate the various working groups in the fields of operations, flight recorders, air traffic services, human factors, maintenance, site surveys, etc. The limits imposed by the resources available and the optimum use of those resources should be discussed. The value of formal arrangements such as memorandums of understanding (MOUs) with other State agencies (for example, law enforcement, coroner, Civil Aviation Authority (CAA)) that may be involved in an investigation should also be addressed. Doc 9756, Part I – *Organization and Planning*, contains thorough guidance on this subject.

Investigators' equipment

3.1.2.4 The equipment to be used during investigations will be determined not only by availability and cost but also by the means available to transport it to the site. Information on the use of contemporary aids such as global positioning systems (GPS), satellite telephones, cellular telephones, unmanned aerial vehicles/drones, and data links back to base,

as well as on the use of basic items such as compasses and inclinometers, should be made available. Means of recording in extreme wet or cold conditions should not be overlooked. Instruction on the proper method of taking samples of aircraft fluids and the appropriate containers should also be included.

Accident site safety

3.1.2.5 The safety of personnel at an aircraft accident site must be understood by the participants of an investigation. An investigator is a valuable resource and must be protected and well equipped with minimum exposure to risk on the field and with the optimum efficiency. Aircraft accidents frequently occur in adverse weather conditions in areas of inhospitable terrain such as mountainsides, swamps and deserts, or in adverse climatological conditions involving snow and ice or fierce heat. The need to take appropriate measures to protect those on the site against exposure to the elements, to any hazardous cargo or dangerous materials released from the aircraft, and against injury or infection, must be understood. There are medical risks and hazards from the aircraft wreckage itself and they must be explained to the investigators. Another subject that should be covered is how to deal with the psychological stress of investigators and other personnel with exposure at an accident site. Biological hazard is an ever-present risk and inoculations against such risks as hepatitis, malaria and tetanus are essential. The use of personal protective equipment against airborne and blood-borne pathogens should be demonstrated. Utilities such as gas mains, electricity transmission lines and main transport routes require special consideration. Finally, a plan for aid and rescue in the event of an accident involving personnel at the site is required by many occupational health and safety organizations and is also dictated by common sense. Relevant guidance is provided in the *Manual on Hazards at Aircraft Accident Sites* (Doc 10205) (forthcoming).

Initial action at the accident site

3.1.2.6 The investigator should have a thorough understanding of the numerous considerations to be taken into account at the accident site. With some exceptions such as accidents involving missing aircraft or resulting in wreckage that is inaccessible, the accident site is the primary area of investigation. The methods of apportioning time effectively, prioritizing the types of information to be gathered, plotting the position of surface marks, and identifying and plotting the position of items of wreckage, as well as the preparation for the removal of any exhibits to a secure site, are considerations that the investigator should become familiar with from the outset. To that effect, it is highly recommended that investigators are provided with training in accident investigation laboratories ("crash labs"). Crash labs are training facilities involving real aircraft accidents recreated from the original occurrences, providing hands-on experience as close to reality as possible.

Protection of evidence

3.1.2.7 To establish a suitable environment for a competent examination of the area and the accident debris, measures should be taken to protect the wreckage from fires, meteorological hazards and souveniring. The need to give priority to recording transient evidence, securing light objects that may be lost in the wind, and recording ground scars and other site markings that may become obliterated should be addressed. The interviewing of rescue personnel for determining the inadvertent movement of wreckage items should also be discussed.

Information gathering techniques

3.1.2.8 The investigator under training should be introduced to the methods of gathering and reviewing relevant documentation and procedures, the interview techniques used for different types of witnesses, the transcription of air traffic services and other recordings, and the review of aerodrome facilities, emergency services responses and meteorological data.

Communication and recording media

3.1.2.9 The various media available for communicating with the accident site and for recording the evidence at the accident site and throughout the investigation are essential elements of an investigation course. Digital video cameras and digital cameras, standard film photography, laptops, tablets, cellular telephones and voice recorders are all useful for

recording the available information as accurately and rapidly as is practicable. As each type of equipment may evolve rapidly, it is an essential subject in the training of an investigator.

Interview techniques

3.1.2.10 People who can contribute by providing information for the investigation vary according to physical condition, nature of involvement and ethnic background. They will also vary based on their understanding of the required information and their exposure to the scenario. Among those who can assist in the investigation by providing valuable background information are relatives and/or friends of a crew member, employees of the operator, air traffic controllers, etc. Consideration should be given to the preparation for interviews, information to be gleaned from body language, relative positioning of the interviewer and interviewee, preparation of the questions to be asked, use of open questions, the art of listening, general conduct of the interview, value of written statements and signed transcripts, and use of recorders such as video cameras, cellular telephones and voice recorders. The precautions to be taken when interviewing the injured or persons in ill health, young people, older people or hostile witnesses, as well as the use of experts in the field of inquiry, should be discussed.

Recorders

3.1.2.11 In addition to the flight recorders, there are many other forms of recorders used in the aviation industry, from the security cameras on the aerodrome perimeter fence to the maintenance recorders in the aircraft, each with potential use to an investigator. The value of each form of recorder, the methods of interpreting and downloading the information, and the sources of readout must be in the course syllabus. Equally, the value of the manufacturer's expertise in recovering information from damaged recorders (such as global positioning receivers, solid-state flight recorders, digital flight recorders, quick access recorders and inertial navigation unit components) should be explored. The means of locating the flight recorders and recovering them from locations that are difficult to reach must be studied. Recorders at air traffic services facilities, particularly those that record radar returns, should be the subject of a separate study, and guidance regarding their potential use for an investigation should be provided. Particular attention should be given to the precautions to be taken in the case of recovering submerged flight recorders.

Protection of investigation records

3.1.2.12 The sole objective of an investigation conducted under the provisions of Annex 13 is the prevention of accidents and incidents, and not the apportioning of blame or liability. The use of investigation records for purposes other than accident or incident investigation, including for disciplinary, civil, administrative or criminal proceedings against operational personnel and/or organizations, may inhibit the future availability of such records and have an adverse effect on investigations. Any judicial or administrative proceeding must be separate from any investigation conducted under Annex 13, in which Standard 5.12 calls for States not to make available certain investigation records for purposes other than accident or incident investigation, unless the competent authority designated by the relevant State determines that their disclosure or use outweighs the likely adverse domestic and international impact such action may have on that or any future investigations. It is expected that States' primary legislation provides for such protection. However, this is not the case for a number of States. The training to be provided needs to consider the system in place, including all existing means of mitigation when legislation is not compliant with ICAO SARPs (like MOUs, operational agreements, etc.). The *Manual on Protection of Safety Information, Part I – Protection of Accident and Incident Investigation Records* (Doc 10053), provides comprehensive guidance on this subject.

Examination of relevant maintenance documents

3.1.2.13 The maintenance history of the aircraft is established primarily from the records held by the operator. However, the investigator must learn to establish whether the maintenance, inspection procedures and servicing that are recorded as having been completed have in fact been carried out, and determine the adequacy of the specified maintenance procedures. In some accidents, this could go as deep as the aircraft certification process, where the maintenance records could be lost. The investigator must be familiar with which records are stored at the CAA and which with maintenance organizations. Thus, a good understanding of such details is desirable.

Fires and explosions

3.1.2.14 The evidence available to distinguish an in-flight fire or explosion from post-accident fires forms a valuable lesson that must be passed on to the new investigator. The means of determining the ignition source and the fuel supply of a fire are important. It is necessary to teach about the effectiveness of firefighting measures available on board the aircraft and the means for preventing post-accident fires during an investigation.

Survival aspects

3.1.2.15 The chances of occupants surviving an accident can be assessed and the means to do so should be given to the accident investigator. The investigator should know the formulas for impact force calculations and the various forms of attenuating impact forces. Discussions on the limits of human tolerance to heat and impact forces, and on the effects of toxic by-products of the accident environment, are worthwhile. The standard pre-flight passenger briefing spiels, restraint systems, seat anchorages, aids to egress from the aircraft and efficiency of rescue and firefighting services are items that should be addressed under this heading. The factors that affect the occupants' chances of surviving the accident must be reviewed. The means of determining the after-effects of a fire on the occupants and the fire's impediment to passenger evacuation should be discussed, as should the availability of such items as smoke hoods and smoke goggles. The accident investigator must understand the methods used to protect aircraft occupants from the impact forces and post-impact effects (such as thermal stress and water immersion). The investigator should be able to assess the effectiveness of the methods and consider making safety recommendations that could provide better protection for occupants in the future.

Structures

3.1.2.16 As the basis for the examination of the wreckage, the study of structures is an area of prime interest to the investigator. The study of structures should include metallurgy, fibre reinforced plastics and timber structures, composite material, stress analysis and the strength of these materials. It should also include the various modes of failure and the characteristics of such failures in the materials used in aircraft structures. The methods of failure analysis, reconstruction of areas of interest in the airframe, and the evidence of the various modes of failure are to be considered. The various types of flight controls and landing gear structures should also be studied under this heading. This section of the syllabus should cover the advanced equipment used in the study of failure mechanisms, the preparation of samples for examination by such equipment, and the methods for comparative testing of similar materials. The study of structures also provides a platform for introducing the means of wreckage trajectory analysis. Every effort should be made to provide examples of the various failure modes in materials used in aircraft construction.

Systems

3.1.2.17 Aircraft systems vary from mechanical controls that can still be found in general aviation aircraft to fly-by-wire systems. There is a wide variety of systems that the investigator should become familiar with in general terms. However, the focus should be on the resources available to assist the investigator in the event of an accident involving a complex system and on common causes of system failure that might be experienced. A lead on system health can often be found in past maintenance records or on-board recorders. It is necessary to discuss, in general terms, fuel, hydraulic, pneumatic, electrical, pressurization, flight control, instruments, navigation, autopilot and instrument systems. Other topics that should be considered include software failures in airborne computers and the adequacy of the protection against catastrophic events ensuing from such failures.

Aerodynamics/aircraft performance

3.1.2.18 The common areas of aerodynamics that frequently assume importance in an investigation are those related to performance and in-flight structural failure caused by overload or flutter. A review of basic aerodynamics and the means of detecting failure from aerodynamic factors should be included in the investigator's basic training. The topics of engine failure recognition speed, V1 and V2, climb gradient, over-speed, engine-out performance, loss of control in-flight, icing and stability also deserve special attention.

Power plants

3.1.2.19 The detailed analysis of power plants is normally the subject of a separate course and is usually carried out in conjunction with the engine manufacturer's representatives. Nevertheless, the explanation of the basic principles of reciprocating and turbine engines has a place in basic and advanced investigation courses. The same is true with regards to the analysis of damage to propellers and helicopter rotors, and a general overview of methods of evaluating damage to determine if further investigation of the particular propeller or engine is warranted. For example, propellers and turbines can give a worthwhile indication of an absence of engine power at the time of impact. This is another subject in which examples of failures and accident damage form an essential part of the course.

Rotary wing aircraft

3.1.2.20 A general introduction to the principles of flight for helicopters and their control systems is relevant. The characteristics associated with failures or deformities of rotary wings must also be seen, as well as the main consequences of tail rotor failures. However, the investigation of helicopter and other rotary wing aircraft accidents can be the subject of a separate specialty course.

Remotely piloted aircraft system (RPAS)

3.1.2.21 The investigation of unmanned aircraft called for in Annex 13 requires specific discussion of the main components of RPAS: remotely piloted aircraft (RPA), which is an unmanned aircraft that is piloted from a remote station; remote pilot station (RPS), being the equipment used to pilot an RPA; and command and control (C2) link, which is the data link between the RPA and the RPS for the purpose of managing the flight.

Human performance

3.1.2.22 No accident investigation can be complete without a thorough consideration of the human factors issues involved. The demands of the environment and aircraft on humans often approach the physiological and psychological limits of the flight crew, maintenance and servicing crews, air traffic services personnel and other personnel required to support aircraft operations. The study of human limitations, communications, fatigue, decision-making processes and flight crew health, and the information available from post-mortem examinations, are vital components of this section of an investigation course. An examination of the handling of the aircraft should encompass the areas of operations and training.

Organizational information

3.1.2.23 Organizational and management information, which is a section of the Final Report, concerns the organizations and management involved in influencing the operation of the aircraft. Organizations include the operator; air traffic services, airway, aerodrome and weather service agencies; and the regulatory authority. The review of the organizational structure and functions as well as the management policies and practices of the agencies, authorities and aircraft operator involved is a subject that should be covered. For example, an investigator should have the competence to review an aircraft operator's management functions, policies and practices in their entirety. There are many aspects of the supervisory process that may have a direct bearing on the accident, such as acceptance of inadequate flight crew qualifications, deficient guidance material, maintenance shortcuts, improper crew rostering, failure to provide proper training in aircraft type, shortcomings in crew resource management, shortcomings in the operation of a safety management system (SMS), and unreasonable pressure to complete schedules on time. The methods of investigating management and organizational aspects of an organization to determine the presence of any risk factors or other shortcomings are essential for a well-rounded accident investigation course. An examination of the means of supervision will include a review of orders, regulations, manuals and independent audits as well as the performance of supervisors, instructors and company management.

3.1.2.24 The topic of operations explores the human-machine and human-medium interfaces, and the actions or lack of actions in the events leading to the accident. Investigation in this area specifically covers how the flight crew members reacted to, analysed and attempted to cope with the complexities of the flight.

3.1.2.25 The topic of training covers the extent and adequacy of the training relevant to the accident flight. Doc 9756, Part III – *Investigation*, the *Manual of Civil Aviation Medicine* (Doc 8984), the *Human Factors Training Manual* (Doc 9683), the *Human Factors Guidelines for Safety Audits Manual* (Doc 9806) and the *Manual on Human Performance (HP) for Regulators* (Doc 10151) are references that can be used in this section of the training.

Determination of the flight crew's suitability for the flight

3.1.2.26 The flight crew members are required to meet certain licensing, training and experience requirements before conducting any flight. In addition, they must be fit for their duty, and the complement of the crew must be appropriate. Familiarity with the flight crew documentation and requirements is essential. Fitness of the flight crew for the flight can be considered as part of several human factor considerations and should be explained in detail. In certain investigations, this could lead to the need to evaluate the performance of the CAA, particularly with regard to the licensing process, existing regulations, as well as the efficiency of oversight. It is desirable that the training provides the minimum knowledge about the functions of that authority.

Methods of analysing the factual information gathered

3.1.2.27 There are several structured procedures for analysing the evidence and facts determined during the investigation. Knowledge of these procedures will enable the investigator to establish whether further investigation is required to complete the investigation or to test any hypotheses that the investigation team is considering.

Report writing

3.1.2.28 Report writing is an integral responsibility of an accident investigator. Annex 13 provides a format for writing a Final Report, which should flow logically from the history of the flight to safety recommendations, and which should contain a minimum of duplication and a full consideration of flight aspects that are relevant to the improvement of safety. Knowledge of this format and related processes should give the investigator a sound basis for drafting the Final Report, including the formulation of appropriate safety recommendations. Doc 9756, Part IV – *Reporting*, contains guidance on report writing and the issuance of safety recommendations as well as safety recommendations of global concern.

The news media and public relations

3.1.2.29 Almost any aircraft accident is of interest to the news media and will to some extent involve the investigator-in-charge in public relations activities. There are two aspects to this subject: the information made available to the public, and the more specialized approach to the survivors and the families of those involved in an accident. Others should be kept informed on the progress of an investigation while not speculating as to the causes and/or contributing factors, and the protection of the privacy of those who assist with sensitive information must be explained to investigators. The *Manual on Assistance to Aircraft Accident Victims and their Families* (Doc 9973) provides sound guidance on family assistance.

State safety programme (SSP)

3.1.2.30 An understanding of the State safety programme (SSP) and the roles and responsibilities of the accident investigation authority, including the SSP coordination group, is essential.

Main functions of a CAA

3.1.2.31 An understanding of the main roles and processes of the CAA is important to identify deficiencies that could have contributed to the accident or incident. Processes related to certification and licensing, as well as the efficiency of oversight activities, are of particular relevance.

Safety management systems (SMS)

3.1.2.32 As part of the investigation, it may be necessary to assess the SMS of an operator or service provider in order to identify deficiencies that could have contributed to the accident or incident. Accurate data collection and analysis, and the identification of hazards and risk management, are of particular relevance.

3.2 ADVANCED ACCIDENT INVESTIGATION COURSE

3.2.1 Recommended topics

3.2.1.1 Most topics covered in the basic course should also apply to advanced courses, but instructors are expected to vary their treatment of these topics to suit the purpose of the course and level of experience of the students. In addition to a review of topics from the basic course, an advanced course should cover the topics in 3.2.1.2 to 3.2.1.4.

3.2.1.2 An advanced course should prepare an investigator for the responsibilities of investigator-in-charge, group leader or accredited representative in the case of a major investigation. Doc 9756, Part II – *Procedures and Checklists*, contains guidance on the investigation of major accidents and on the investigation management system.

3.2.1.3 In addition to reviewing the organization and management of a major investigation, students should cover topics such as:

- a) the provision of information on the progress of the investigation in support of the State's family assistance programme;
- b) relations with the media;
- c) an introduction to methods for cataloguing a large number of fragments of wreckage;
- d) management of a large accident site for security, safety and protection of personnel;
- e) preparation of briefings and answers to formal questions for members of government;
- f) the methods of undertaking investigations that involve both civil and military aircraft; and
- g) liaison with law enforcement authorities in accidents involving unlawful interference.

3.2.1.4 Other specific subjects that should be included in advanced courses include:

- a) techniques used to investigate accident-damaged systems that involve specialized technologies such as glass cockpit, fly-by-wire systems, global navigation satellite systems/GPS, enhanced ground proximity warning systems (EGPWS), an airborne collision avoidance system or automatic dependent surveillance – broadcast;
- b) readout and analysis of flight recorders;
- c) the use of virtual video presentations in large structural reconstructions of wreckage; and
- d) the use of computer simulations and programmes for flight simulators to recreate aspects of the aircraft's flight path and performance that are of interest to the investigation.

3.3 SPECIALTY COURSES

3.3.1 Specialty courses may be introduced to an investigator at any stage after the basic investigation course. These courses can augment the skills and knowledge obtained by the investigator in order to meet the needs of a particular area of the investigation.

3.3.2 Topics such as helicopter accident investigation, gas turbine engine accident investigation, accident survival aspects, fires and explosions, human factor investigation, and family assistance and media relations are generally extensive enough to warrant a short course of their own with a specialized syllabus.

3.3.3 A description of the systems involving specialized technologies (such as glass cockpit, fly-by-wire systems, GPS, electronic flight instrument system and EGPWS) is usually provided during aircraft type courses. However, aircraft type courses do not include the investigation aspects nor the investigation techniques for such complex systems. Extensive information can be obtained from memory chips and other electronic circuits used in new technology systems. Increasingly, the investigation techniques for electronic circuits are covered in accident investigation courses. Nevertheless, accident investigation authorities should contact the manufacturers of such systems for specialty courses, since most manufacturers have trained investigators and support personnel who are familiar with the systems and the investigation techniques required to extract the information stored in the systems.

CHAPTER 4

GENERAL PROVISIONS FOR COMPETENCY-BASED TRAINING

4.1 INTRODUCTION

4.1.1 The full application of a competency-based training (CBT) and assessment methodology may not be suitable for aircraft accident investigator functions. Instead, high-level guidance on an adapted CBT model may be more appropriate and useful for States' accident investigation authorities, which, based on their size and resources, could then determine how to apply the model.

4.1.2 Competency is defined as a dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviours that mobilize the relevant knowledge, skills and attitudes (of an investigator) to carry out activities or tasks under specified conditions.

4.1.3 CBT is a training system that is characterized by a performance orientation, emphasis on standards of performance, and the development of training to the specified performance standards. It has proven to be an effective tool for ensuring that investigators are trained for task-oriented functions and that resources are used efficiently, and for the enhancement of competency in different areas of investigations.

4.1.4 Adapted CBT enables the accident investigation authority to demonstrate an investigator's range of knowledge, skills and attitudes based on the investigator's job description. After analysis, competencies to perform the tasks should be identified to develop the proper training that will enable the investigator to carry out the work.

4.1.5 The development of CBT should be based on a systematic approach whereby competencies and associated standards are defined, training is based on the competencies identified, and appraisals can be developed to determine whether these competencies have been achieved.

4.2 PRINCIPLES OF COMPETENCY-RELATED TRAINING

Below are the main principles of competency-related training:

- a) Relevant competencies are clearly defined for a particular role within an aviation discipline, for example, investigation.
- b) There is an explicit link between competencies, training and the required performance on the job.
- c) Competencies are formulated in a way that ensures that investigators can be trained for, and observed and appraised in, a variety of investigation contexts.
- d) Investigators successfully demonstrate competency by meeting the associated competency standard.

- e) Each stakeholder in the process, including the investigator, instructor and training organization, has a common understanding of the competency standards.
 - f) Clear performance criteria are established for appraising competencies.
 - g) Evidence of competent performance is valid and reliable.
 - h) Performance appraisals are calibrated to achieve a high degree of inter-rater reliability.
 - i) Appraisal of competencies is based on multiple observations across multiple investigation contexts.
 - j) To be considered as competent, the investigator demonstrates an integrated performance of all the required competencies to a specified standard.
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CHAPTER 5

COMPETENCY-BASED TRAINING FOR ACCIDENT INVESTIGATORS

5.1 ADAPTED COMPETENCY-BASED TRAINING MODEL

5.1.1 The adapted competency-based training (CBT) model for accident investigators is composed of 10 competencies:

Competency 1:	Code of ethics and standards of professional conduct
Competency 2:	Managing an accident/incident investigation
Competency 3:	Leadership and teamwork
Competency 4:	Coping, adapting and learning
Competency 5:	Investigation risk management
Competency 6:	Collecting data and controlling evidence
Competency 7:	Interviewing witnesses, crew members and other persons
Competency 8:	Analysing/critical thinking
Competency 9:	Report writing
Competency 10:	Communicating

5.1.2 The ICAO Competency Framework for Aircraft Accident Investigators and the associated competency descriptions and observable behaviours are provided in 5.2.

5.1.3 Each accident investigation authority should consider the application of the ICAO Competency Framework for Aircraft Accident Investigators based on:

- a) the size and extent of its activities; and
- b) its existing human and financial resources.

5.2 ICAO COMPETENCY FRAMEWORK FOR AIRCRAFT ACCIDENT INVESTIGATORS

COMPETENCY 1: CODE OF ETHICS AND STANDARDS OF PROFESSIONAL CONDUCT

Description Demonstrates attributes and values in accordance with fundamental values of the accident investigation authority.

- Observable behaviours**
- Acts with integrity, competence and diligence and respects all people with whom the investigator may interact during an investigation.
 - Places the integrity of the investigation and the safety of the public above all other considerations.
 - Uses sensitivity when dealing with victims, human remains, survivors, interviewees and others.
 - Verifies the accuracy of work, ensuring that it is based on all available evidence, confirming information before its release and using original sources whenever possible.
 - Exercises independence, diligence and thoroughness in analysing investigation data, and has a reasonable and adequate basis from which to draw conclusions, supported by appropriate research and investigation.
 - Protects confidential and private information and respects the privacy rights of people involved in the accident as well as people who provide information to the investigation.
 - Treats others respectfully, fairly and objectively, regardless of differences.
 - Identifies and mitigates conflict of interest situations.
 - Recognizes the pressures of the investigation and its effects on others.
 - Is accountable for his or her own actions.

COMPETENCY 2: MANAGING AN ACCIDENT/INCIDENT INVESTIGATION

Description Develops an investigation plan to achieve the objectives of the investigation.

- Observable behaviours**
- Establishes defined investigation objectives and milestones in consideration of expected safety benefits, time, political and public pressures.
 - Identifies States and stakeholders involved and determines the appropriate level of interaction with these.
 - Ensures that applicable Annex 13 provisions are applied in a timely manner.
 - Estimates the human and financial resources required, based on the investigation scope and objectives.
 - Assesses risks and threats associated with the management of the investigation and devises appropriate mitigations.

- Plans all examinations, tests and research activities according to the investigation scope and ensures that they meet the objectives.
- Tracks the progress of the investigation against the plan and the expected outcome.
- Identifies needs to amend the investigation plan based on established evidence to date, changing circumstances or a revised scope.

COMPETENCY 3: LEADERSHIP AND TEAMWORK

Description Participates effectively in the achievement of the investigation objectives and has a clear understanding of his or her role and assigned tasks. Motivates the investigation team and highlights the importance of achieving the investigation objectives by providing guidance, instruction and direction, as appropriate.

- Observable behaviours**
- Assigns the various investigation roles to the investigation team members considering the scope of the investigation and the investigators' areas of competency.
 - Sets clear objectives with specific expectations.
 - Defines and shares objectives with the investigation team members, clarifies time targets, and adapts and rephrases the objectives of team members according to evolving investigation challenges.
 - Leads the investigation team and communicates with other involved entities.
 - Monitors team performance and provides guidance when necessary.
 - Coordinates and integrates team member inputs by maintaining open communications within the team.
 - Communicates with the team openly to share expertise, knowledge and information, and effectively participates in the investigation progress meetings.
 - Adapts communication to consider the personal level of emotion in traumatic situations.
 - Promotes respect and sensitivity among the team members and between the team and stakeholders.
 - Commits to the highest quality of work and to the timely publication (reflective of the complexity) of applicable interim statements and the investigation Final Report.
 - Identifies the requirements and issues safety recommendations without delay.
 - Uses a team consensus approach for planning and establishing findings.

COMPETENCY 4: COPING, ADAPTING AND LEARNING

Description Applies sound judgment to issues that appear during the investigation and uses learning opportunities from new investigation standards, methodologies, techniques or technology.

- Observable behaviours**
- Sets and applies personal rules to cope with a high-pressure environment.
 - Recognizes personal emotions in difficult situations and complex environments.
 - Organizes ways to maintain and improve knowledge, investigation techniques, methodologies and standards.
 - Adapts to changing circumstances, new evidence and amendments to the investigation plan as they become apparent through the investigation management system.
 - Considers valid new ideas.
 - Copes with ambiguity and uncertainty by organizing, in real time, the key elements of an action or of the project.

COMPETENCY 5: INVESTIGATION RISK MANAGEMENT

Description Identifies the various investigation risks, including those from the predefined hazard register and any additional hazards that become apparent during the investigation, and then implements risk control and mitigation actions appropriately.

- Observable behaviours**
- Identifies States that are entitled to participate in the investigation according to Annex 13.
 - Solves political disputes among concerned States and applies relevant Annex 13 provisions diplomatically.
 - Ensures that the investigation is separate from any judicial or administrative proceedings to apportion blame or liability.
 - Resolves possible conflicts with judicial authorities regarding the custody of flight recorders and the wreckage.
 - Identifies accident site hazards rapidly and comprehensively.
 - Determines and implements measures to eliminate and/or mitigate accident site risks.
 - Assesses the effectiveness of those measures.
 - Estimates investigation safety and operational risks.

COMPETENCY 6: COLLECTING DATA AND CONTROLLING EVIDENCE

Description Obtains information relevant to the occurrence from organizations and persons having such information and from persons directly involved in the occurrence.

- Observable behaviours**
- Applies site and wreckage documentation techniques.
 - Applies accident photography and video techniques.
 - Determines the wreckage pieces, components and other onsite evidence that need to be subjected to further examination.
 - Applies evidence recovery and preservation techniques.
 - Interprets relevant data from the various flight recorders and other recording media (for example, flight data analysis programme, quick access recorder, data recovery, non-volatile memory, GPS, and helicopter health and usage monitor system).
 - Interprets data recorded by phones, tablets, radar, air traffic control, electronic flight bags, primary flight displays, etc.
 - Examines relevant data from the records of the flight crew, flight controllers and other involved personnel.
 - Takes relevant notes from the records of the aircraft airframe, engines and propeller(s).
 - Records data collected during the testing/examination of the aircraft/wreckage and any data collected during test and research.
 - Takes notes from the review of the various aircraft manuals, organizations' operations manuals, standard operating procedures, etc.
 - Collects data relevant to any system that may have contributed to the accident from the aircraft design organization/manufacture and/or certification authority.
 - Identifies, obtains and distributes information needed for the identification of continuing airworthiness concerns in a timely manner.

COMPETENCY 7: INTERVIEWING WITNESSES, CREW MEMBERS AND OTHER PERSONS

Description Obtains information from persons who witnessed the occurrence, who may have information relevant to the occurrence and persons directly involved in the occurrence.

- Observable behaviours**
- Identifies eyewitnesses and other witnesses to the occurrence.
 - Identifies crew members and persons who may have relevant information on the occurrence.
 - Adapts and responds empathically to those persons' behaviours.
 - Prepares questions after referring to the records, recordings, manuals and procedures.

- Applies cognitive interviewing techniques that maintain interviewee interest to encourage the interviewee to give valid and credible answers.
- Documents the interviews for future reference.

COMPETENCY 8: ANALYSING/CRITICAL THINKING

Description Applies analysis method(s) to draw conclusions from direct and circumstantial evidence.

- Observable behaviours**
- Evaluates the validity and credibility of the collected data and evidence.
 - Selects and uses appropriate analysis methods, models and techniques to identify and communicate relationships between the established facts, analyses and findings.
 - Develops a sequence of events from data collected from various sources.
 - Applies an integrated process to analyse human factors data to identify relationships of performance of crew, maintenance, air traffic control and other persons involved in the flight.
 - Identifies any systemic organizational deficiencies, including in the effectiveness of the applicable safety management system (SMS), State safety programme and State regulatory authority's oversight.
 - Analyses and establishes any connections between regulatory, oversight and organizational systemic deficiencies that may have contributed to the occurrence.
 - Develops effective safety recommendations.
 - Identifies safety recommendations of global concern.
 - Identifies the need to publish safety recommendations, as appropriate.

COMPETENCY 9: REPORT WRITING

Description Presents the investigation outcomes in a manner that enables the reader to understand the safety lessons.

- Observable behaviours**
- Develops the investigation reports to meet relevant Standards of Annex 13.
 - Writes reports in clear language that is appropriate to the target audience and context of the investigation.
 - Presents relevant background of information based on facts.
 - Writes unemotionally and without implying blame.
 - Presents the main events in a chronological sequence.

- Presents an analysis showing the linkages between the different parts of the factual report to substantiate the analyses, findings and safety recommendations.
- Presents the safety recommendations in a clear format.

COMPETENCY 10: COMMUNICATING

Description Communicates effectively to ensure optimum implementation of investigation tasks, presentation of the investigation outcomes and acceptance of safety recommendations.

- Observable behaviours**
- Describes investigation observations during the investigation progress meetings in clear investigation language and using technical and operational terminology.
 - Interacts with investigation stakeholders to coordinate the site investigation and off-field data collection.
 - Handles post-accident communications and media interaction.
 - Considers the requirements of the family assistance plan while ensuring the proper protection of accident investigation information as well as pertinent investigation records.
 - Coordinates effectively with the judicial authority's investigators.
 - Presents clear and precise descriptions of investigation outcomes to States' representatives.
 - Articulates safety recommendations to the organizations concerned in a way that makes such recommendations understood and accepted as being necessary for action.
 - Adapts content, style, tone and media of communication to suit the target audience, considering cultural aspects and the promotion of dialogue.

— END —

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