TRAINING MANUAL AND INVESTIGATION FIELD GUIDE

FOR

(OFFICERS AND INVESTIGATORS)

AIRCRAFT ACCIDENT INVESTIGATION BUREAU OF MONGOLIA,
MINISTRY OF ROAD AND TRANSPORTATION

Nisekhiin Street, 10th khoroo, Khan-Uul District
Ulaanbaatar 17120, Mongolia
Tel: (976) 11 282026
(976) 9595-3399 (mobile)
Fax: (976) 70049974
E-mail: aaib@aaib.gov.mn
Website: www.aaib.gov.mn

Approval Sheet

TRAINING MANUAL

Edition: 1
Issue Date: **10 Mar 2015**

Revision: 1
Revision Date: **10 Mar 2015**

Organization: AAIB OF MONGOLIA
Phone: (976) - 95953399
Fax: (976) - 70049974
Email: aaib@aaib.gov.mn

Address: Str.Nisekh, 10th khoroo, Buyant-Ukhaa,
Khan-Uul District, Ulaanbaatar 17120, Mongolia

Signatures below assure that this document is prepared and approved

Prepared by:	Accepted by:	Approved by:
Name: O.Bat-Orshikh Title: Investigator Signature: Date: 10 MAR 2015	Name: Kh.Narankhuu Title: Senior Investigator Signature: Date: 10 MAR 2015	Name: Yo.Enkhtur Title: Head of AAIB Signature: Date: 10 MAR 2015

RECORD OF REVISIONS

Revision No.	*Date of Revision*	*Affected Pages*	*Remarks/Purpose of Revisions*
Original	10 MAR 2015	All	First Edition
1			
2			
3			
4			
5			

DISTRIBUTION LIST

Copy No	Location/Organization	Name/Position	Distributed date	Format
1	**AAIB Office room №202**	**Yo. Enkhtur Head of AAIB**	**10 MAR 2015**	**Hard**
2	AAIB Office room №203	O. Bat-Orshikh Investigator	10 MAR 2015	Hard
3	AAIB E-Library	A.Uuganbayar Specialist	10 MAR 2015	PDF,WORD

LIST OF EFFECTIVE PAGES

Page	Issue Date	Rev. No	Rev. Date
CHAPTER 0			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
4	10 Mar 2015	0	10 Mar 2015
5	10 Mar 2015	0	10 Mar 2015
6	10 Mar 2015	0	10 Mar 2015
7	10 Mar 2015	0	10 Mar 2015
8	10 Mar 2015	0	10 Mar 2015
9	10 Mar 2015	0	10 Mar 2015
10	10 Mar 2015	0	10 Mar 2015
11	10 Mar 2015	0	10 Mar 2015
CHAPTER 1			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
CHAPTER 2			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
CHAPTER 3			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
4	10 Mar 2015	0	10 Mar 2015
5	10 Mar 2015	0	10 Mar 2015
6	10 Mar 2015	0	10 Mar 2015
7	10 Mar 2015	0	10 Mar 2015
8	10 Mar 2015	0	10 Mar 2015
9	10 Mar 2015	0	10 Mar 2015

Page	Issue Date	Rev. No	Rev. Date
CHAPTER 4			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
4	10 Mar 2015	0	10 Mar 2015
CHAPTER 5			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
CHAPTER 6			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
CHAPTER 7			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
4	10 Mar 2015	0	10 Mar 2015
5	10 Mar 2015	0	10 Mar 2015
6	10 Mar 2015	0	10 Mar 2015
7	10 Mar 2015	0	10 Mar 2015
8	10 Mar 2015	0	10 Mar 2015
9	10 Mar 2015	0	10 Mar 2015
10	10 Mar 2015	0	10 Mar 2015
11	10 Mar 2015	0	10 Mar 2015
12	10 Mar 2015	0	10 Mar 2015
13	10 Mar 2015	0	10 Mar 2015
14	10 Mar 2015	0	10 Mar 2015
CHAPTER 8			
1	10 Mar 2015	0	10 Mar 2015

Page	Issue Date	Rev. No	Rev. Date
CHAPTER 9			
1	10 Mar 2015	0	10 Mar 2015
FORMS			
1	10 Mar 2015	0	10 Mar 2015
2	10 Mar 2015	0	10 Mar 2015
3	10 Mar 2015	0	10 Mar 2015
4	10 Mar 2015	0	10 Mar 2015
5	10 Mar 2015	0	10 Mar 2015
6	10 Mar 2015	0	10 Mar 2015
7	10 Mar 2015	0	10 Mar 2015
8	10 Mar 2015	0	10 Mar 2015
9	10 Mar 2015	0	10 Mar 2015
10	10 Mar 2015	0	10 Mar 2015
11	10 Mar 2015	0	10 Mar 2015
12	10 Mar 2015	0	10 Mar 2015
13	10 Mar 2015	0	10 Mar 2015
14	10 Mar 2015	0	10 Mar 2015
15	10 Mar 2015	0	10 Mar 2015
16	10 Mar 2015	0	10 Mar 2015
17	10 Mar 2015	0	10 Mar 2015
18	10 Mar 2015	0	10 Mar 2015
19	10 Mar 2015	0	10 Mar 2015
20	10 Mar 2015	0	10 Mar 2015
21	10 Mar 2015	0	10 Mar 2015
22	10 Mar 2015	0	10 Mar 2015
23	10 Mar 2015	0	10 Mar 2015
24	10 Mar 2015	0	10 Mar 2015
25	10 Mar 2015	0	10 Mar 2015
26	10 Mar 2015	0	10 Mar 2015
27	10 Mar 2015	0	10 Mar 2015
28	10 Mar 2015	0	10 Mar 2015
29	10 Mar 2015	0	10 Mar 2015
30	10 Mar 2015	0	10 Mar 2015
31	10 Mar 2015	0	10 Mar 2015
32	10 Mar 2015	0	10 Mar 2015

TABLE OF CONTENTS

TERMINOLOGY

The definition of the terminology is hereby given to ensure that the readers understand the intended meaning of the terms in the context of this circular.

Accident investigation authority.

The State organization responsible for conducting aircraft accident investigations.

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.

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.

Expert/Specialist.

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

Investigation.

A process conducted for the purpose of accident prevention. It includes the gathering and analysis of information, the drawing of conclusions, the determination of causes and the making of safety recommendations.

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.

Observer.

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

INTRODUCTION

Aircraft accident investigation is a specialized task which should be undertaken by qualified investigators only. Air Accident and Incident Investigation Bureau (AAIB) Mongolia has been established in year 1980. Earlier Air Safety Directorate of MCAA Group was carrying out the functions and duties of investigation and prevention of accidents. Initially AAIB is being manned by qualified and experienced investigators from Airline and CAA.

Aircraft accident investigation is a specialized task, which should only be undertaken by qualified investigators. It is therefore of the utmost importance that suitable persons are identified and appropriately trained to carry out this difficult task and to be able to obtain job satisfaction in this as their chosen career.

The investigation of an aircraft accident is also a task that can be almost unlimited in scope. Therefore, some investigations will be curtailed by the resources available, unless proper management of the investigations is exercised. The investigator-in-charge is responsible for ensuring that the expenditure of the resources available results in an investigation that extracts the maximum benefit to the safety of aviation.

Recruiting of Investigators

The experience and employment background of an aspiring investigator is therefore a very important aspect in the recruitment and training of aircraft accident investigators. 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 from civil or military qualification 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.

Training of Investigators

Training will involve the progressive training considered 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.

Since accident investigations will often involve specialized areas, it is important that those selected for training as investigators understand the aviation infrastructure and are able to relate to the many different areas of aviation. Since the outcome of an accident investigation is largely dependent upon the aviation knowledge, skills and experience of the assigned aircraft accident investigators, they should have: an understanding of the depth of investigation that is necessary in order for the investigation to conform with the legislation, regulations and other requirements of the State for which they are conducting the investigation;

- a knowledge of aircraft accident investigation techniques;
- an understanding of aircraft operations and the relevant technical areas of aviation;

- the ability to obtain and manage the relevant technical assistance and resources required to support the investigation;
- the ability to collect, document and preserve evidence;
- the ability to identify and analyze pertinent evidence in order to determine the causes and, if appropriate, make safety recommendations; and
- the ability to write a final report that meets the requirements of the accident investigation authority of the State conducting the investigation.

Training a person for aircraft accident investigation involves several phases. These phases include initial training, on-the-job training, a basic accident investigation course and an advanced accident investigation course supplemented by specialized courses. While on-the-job training is an ongoing 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 the techniques learned. Formal courses are designed to complement on-the-job training by exposing trainee investigators to a cadre of experts who can pass on the details of their specialties to their students. The experts are usually recruited from those with experiences in a particular area of accident investigation.
They include experienced investigators, aviation medicine physicians, psychologists, aeronautical engineers and manufacturers' representatives.

Structured courses in aircraft accident investigation are conducted by universities, manufacturers, military establishments, accident investigation authorities and other educational institutions. Following the initial training, an accident investigation authority should provide on-the-job training for a new investigator. During this second phase, the new investigator will practice the procedures and tasks covered in the initial training, and gain familiarity with investigation techniques. This training will also familiarize him 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 on-the-job training often involves more than one experienced investigator and is not limited to investigations within the State that employs the trainee/investigator.

Attributes of an Investigator

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 analyze facts in a logical manner; perseverance in pursuing inquiries, 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.
Investigators are also expected to be prepared to travel for extended periods of time at short notice, both within the Mongolia and internationally. It may at times also require the handling and removal of body parts involving fatalities and working closely with the police and pathologists. A career involving aircraft accident investigation does call for support by an understanding family.

Accident investigation as a career

To be successful and have job satisfaction in his or her career as an investigator, there is a need for dedication, a willingness to work under stressful conditions and to have a desire and an unwavering interest to improve aviation safety. Without this, the investigator will not be successful and be able to obtain job satisfaction in this chosen career.

Investigative equipment

Although an investigator may desire an unlimited amount of resources at his/her disposal while investigating an aviation mishap, in reality they must prepare their own equipment to arrive on scene capable of completing a thorough fact finding endeavor. To assist with this effort, a field or "Go" kit should be assembled to assist with preserving and documenting all evidence in a relatively short period of time. It is pointless to head to an aircraft accident site without taking a few preparatory actions first and bringing the right equipment. For the investigator, two basic rules apply when preparing to investigate an aviation mishap:

- attempt to bring everything that will be needed
- be prepared to carry the equipment over any form of terrain.

Section I (Preparation) identifies a *minimum* equipment list that should be included in the investigator's tool bag.

CHAPTER 1. QUALIFICATION AND EXPERIENCE

1.1 General

Since the outcome of an accident investigation is largely dependent upon the aviation knowledge, skills and experience of the assigned aircraft accident investigators, they should have:

- an understanding of the depth of investigation that is necessary in order for the investigation to conform with the legislation, regulations and other requirements.
- a knowledge of aircraft accident investigation techniques;
- an understanding of aircraft operations and the relevant technical areas of aviation;
- the ability to obtain and manage the relevant technical assistance and resources required to support the investigation;
- the ability to collect, document and preserve evidence;
- the ability to identify and analyze pertinent evidence in order to determine the causes and, if appropriate, make safety recommendations; and
- the ability to write a final report that meets the requirements of the accident investigation.

1.2 Recruitment requirement

The recruitment experience requirements for senior levels in the AAIB are civil aircraft accident investigation as per the obligation of ICAO Annex 13. However at entry level officers with experience & qualification in various fields of aviation will be recruited with a knack for qualitative and investigative analysis. Qualification in the legal and statistical analysis field will be desirable qualification. In addition a panel of experts will be kept with above type of experience. When assigned to an accident investigation, such personnel will be relieved of their regular duties as and when required for the investigation.

1.3 Experience requirement

As of now and in future, the appropriately qualified personnel available with the AAIB will require training in the accident investigation techniques in order to participate in or to conduct an aircraft accident investigation. These personnel will have considerable practical experience in aviation as a foundation on which to build their investigation skills such as a pilot, aeronautical engineer or aircraft maintenance engineer. Personnel qualified in flight operations, airworthiness, air traffic management, or aviation related management will also be provided accident investigator training, since accident investigations will often involve specialized areas. It will be ensured at all times that those selected for training as investigators understand the aviation infrastructure and are able to relate to the many different areas of aviation.

1.4 Qualification requirement

An accident involving a general aviation or small commuter aircraft, depending on the conditions may be investigated by a Committee of Inquiry comprising of two persons or at times small reports prepared by a single investigator. Most likely, the investigators will be drawn from a panel of experts maintained with the AAIB. The experts should have at least attended the introductory Aircraft Accident Investigation course covering the procedures as per ICAO Annexure 13. In these investigations, it is desirable for operations investigator to have some technical experience and for an engineering investigator to have some operational experience. In addition, the investigators should have a comprehensive understanding of the interrelationship of each of the supporting services that are necessary to operate an aircraft in the aviation environment.

1.5 Personal requirement

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; ability to analyze facts in a logical manner; perseverance in pursuing inquiries, 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

Aircraft accident investigators require different levels of experience, knowledge and training according to the particular role to which they are assigned. AAIB officers will be imparted training commensurate with their responsibilities as an accident investigator, group leader, investigator-in charge, and accredited representative or expert. The panel of experts will be imparted training to act as advisers, experts or specialist. The training guidelines and course will be planned in such a way that the investigators receive appropriate levels of training and will enable them to perform efficiently in any of the roles assigned to them.

Training a person for aircraft accident investigation involves several phases. These phases include initial training, on-the-job training, a basic accident investigation course and an advanced accident investigation course supplemented by specialized courses. While on-the-job training is an ongoing process that continues for many years, there will be sufficient time intervals between each formal course to allow the investigator to consolidate the information and the techniques learned.

Formal courses are designed to complement on-the-job training by exposing the AAIB officers to a cadre of expert investigators. The experts conducting the training will be from those with experiences in a particular area of accident investigation i.e. aviation medicine physicians, psychologists, aeronautical engineers and manufacturers' representatives. Structured courses in aircraft accident investigation will also be conducted by AAIB as and when required.

2.2 Phase 1. Initial training

Every officer on joining AAIB will be imparted initial training. In case very few officers join the training may be imparted in parts. The aim of the initial training is to familiarize new investigators with the legislation and with the procedures and requirements of the AAIB. The following subjects are included in the initial training or indoctrination:

- Administrative arrangements
    - Aircraft Act & Aircraft (Investigation of Accidents and Incidents) Rules 2012;
    - International agreements (including Annex13—Aircraft Accident and Incident Investigation);
    - Memoranda of understanding with other organizations;
    - Liaison arrangements with local authorities;
    - Structure of the AAIB;
    - Aircraft accident investigation procedures manual;
    - Definitions and accident classification;
    - Equipment and tools;
    - Transport arrangements;
    - Ethics and conduct; and

- Expenditure control

- Initial response procedures
  - Procedures for calling after occurrence;
  - Notification of other Mongolian authorities and organizations;
  - Securing of records, recordings and samples;
  - Photography
  - Handling of Flight Recorders
  - Accident site jurisdiction and security;
  - Investigator safety including psychological stress;
  - Recovery of human remains;
  - Requests for autopsies; and
  - Family assistance.
- Investigation procedures
  - On site investigation;
  - Preservation of evidences;
  - Authority and responsibility;
  - Size and scope of the investigation;
  - Investigation management;
  - Use of specialists;
  - Parties to the investigation, accredited representatives, advisers and observers; and
  - Release of information to the news media.
- Reports
  - Preliminary report;
  - Final report including aspect of reopening;
  - Submission of reports and ADREP;
  - Follow up on recommendations;

2.3 Phase 2. On-the-job training

Following the initial training, on-the-job training will be imparted to officers. During this second phase, they will practice the procedures and tasks covered in the initial training, and gain familiarity with investigation techniques. This training will also familiarize them 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 on-the- job training will be carried out by associating with the ongoing investigations with one of the experienced investigators and will not be limited to one investigation.

2.4 Phase 3. Basic accident investigation courses

After completing the phase 1 and phase 2 of the initial training, the officer who is under training will attend a basic accident investigation course as soon as is practicable, preferably within the first year of recruitment. A basic course will have syllabus that includes the subjects at Annexure I.

2.5 Phase 4. Advanced accident investigation courses and additional training

2.5.1 Advanced accident investigation courses.

Once an officer gains experience as a trained investigator, he will be sent for an advanced accident investigation course where he can update his knowledge of the basic techniques and increase his knowledge in special areas relevant to accident investigations.

2.5.2 Additional training.

Additionally they will be called upon to investigate accidents involving a variety of aircraft types, thereby getting an opportunity to have a basic knowledge of most of the major air transport aircraft types that are operated in Mongolia. In this regard the officers will be asked to undergo aircraft technical training courses at manufacturers and operators facilities. Preferably, such aircraft type courses which include specialized technology transport category aircraft (i.e. aircraft equipped with a glass cockpit, fly-by-wire systems and aircraft which contain composite materials in their structure). Investigators with a technical or engineering background will attend the aircraft type courses for technical/maintenance personnel. Similarly, investigators with a pilot background will attend the aircraft type courses for pilots, which could include introductory flight training in a flight simulator.

In accordance with Annex 13, the State of Design and the State of Manufacture participate as accredited representatives in investigations involving the type of aircraft that are designed or manufactured in their State. Although the accredited representatives are usually accompanied by expert advisers from the design organization and the manufacturer, it will be ensured that the investigators, who are appointed as accredited representatives have a basic knowledge of the aircraft designed or manufactured in Mongolia.

Efforts will also be made to impart other additional training to officers by sending them to attend conferences and seminars conducted by aircraft accident investigation organizations, such as the International Society of Air Safety Investigators (ISASI), IAF. The officers will be deputed to major investigations as observers.

CHAPTER 3. COURSE GUIDELINES

3.1 Basic course

3.1.1 Recommended topics

Basic aircraft accident investigation courses will cover the following topics:

- the responsibilities of the States involved, as defined in Annex 13 — Aircraft Accident and Incident Investigation;
- the accident site considerations, such as security, hazards, safety precautions, wreckage diagramming, collection of evidence and control of access;
- the investigators‘ personal equipment and protective clothing;
- the examination and recording of the wreckage and witness marks;
- the range of apparatus available for recording evidence;
- witness interview techniques;
- the full range of in-flight recorders and ground-based recorders;
- the determination of the time and origin of any aircraft fires;
- crashworthiness and survival aspects;
- the properties and the modes of failure of materials used in the aircraft structure;
- the design of aircraft systems and likely modes of failure;
- aerodynamics and aircraft performance;
- the examination of power plants;
- human performance;
- aviation medicine and pathology; and
- the methodology of report writing.

3.1.2 Detailed breakdown of the topics that will be covered

3.1.2.1 General Introduction

The first phase of a course will introduce 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 Contracting States in the field of aircraft accident investigation. The applicable international agreements and SARPs are contained in Annex 13 — Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation. Relevant guidance material from the Manual of Aircraft Accident Investigation (Doc 6920) and Manual of Aircraft Accident and Incident Investigation (Doc 9756) will be used for training. A review of these documents and their salient points will be done so that the investigator knows where to find the information on the relevant topics. General guidance will also be given on the investigation of accidents involving unlawful interference and inaccessible or missing aircraft.

3.1.2.2 Accident notification procedures

The trainees will be introduced to the accident notification systems and the appropriate responses to be expected from each State and organization that are notified. This introduction will cover the ways on how the notification of the occurrence of an accident initiates the process of an investigation. It will 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 are involved by providing a permanent base for the investigation due to their proximity to an accident site. They will 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 will be reviewed, as will be the benefits of access provided by the international agreements inherent in Annex 9 — Facilitation.

3.1.2.3 Investigation management

The introduction will cover the role of the investigator, the skills he will need to acquire, and the accident investigation process. He will be made aware of the value of assessing the availability of resources (such as funding, personnel, equipment and buildings) as well as the planning for the investigation of a major accident beforehand. He will 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. An appreciation of the realities of the limits imposed by the resources available and the optimum use of those resources will be discussed. The value of memoranda of understanding with departments and organizations that might be involved in an investigation will also be addressed.

3.1.2.4 Investigators' equipment

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) and data links back to base, as well as on the use of basic items such as compasses and inclinometers will be made available. Instruction on the proper method of taking samples of aircraft fluids and the appropriate containers will also be included.

3.1.2.5 Accident site safety

The safety of personnel at an aircraft accident site is of paramount importance and must be understood by participants of an investigation. An investigator is a valuable resource and it is important that he is protected and well equipped to do his work in the field with as little risk as is practicable 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 climatologically conditions involving 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 will be covered is how to deal with psychological stress of investigators and other personnel with exposure at an accident site. Disease is an ever-present risk and inoculations against such risks as hepatitis, malaria and tetanus are essential. The use of protective equipment against airborne and blood borne pathogens will 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.

3.1.2.6 Protection of evidence

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 severing. 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 will be addressed. The conduct of interviews with the rescue personnel will also be discussed in order to facilitate the determination of the movement of items of wreckage, which they may have caused inadvertently.

3.1.2.7 Initial action at the accident site

The trainee will be given a thorough understanding of the numerous considerations that should 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 important considerations that the investigator should become familiar with from the outset.

3.1.2.8 Information gathering techniques

The trainee will 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.

3.1.2.9 Communication and recording media

The various media available for communicating to and from an 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 and hand-held computers with connections via telephones to sources of information of immediate use

at the accident site, and tape recorders are all useful for recording the available information as accurately and rapidly as is practicable. As each type of equipment is evolving rapidly, it will be an essential subject in the training of an investigator.

3.1.2.10 Witness interviews

The range of witnesses varies with physical condition, nature of involvement, and differences in ethnic backgrounds. They will also vary in their value based on their understanding of the required information and their proximity to the scene. They may be a visual witness who saw an event or an aural witness who heard a sound or relevant conversation. The preparation for interviews, information to be gleaned from body language, the relative positioning of the interviewer and interviewee, preparation of the questions to be asked, the use of open questions, the art of listening and general conduct of the interview, the use of recorders such as video cameras and tape recorders, the value of written statements and signed transcripts will be considered. The precautions to be taken when interviewing the injured or persons in ill health, the young, the aged and hostile witnesses as well as the use of experts in the field of inquiry will be discussed.

3.1.2.11 Recorders

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 will be in the course syllabus. Equally, the value of manufacturer‘s expertise in recovering information from damaged recorders (such as global positioning receivers, solid-state flight recorders and inertial navigation unit components) will be explored. Another aspect of importance is the means of locating the flight recorders and recovering them from locations that are difficult to reach. Recorders at air traffic services facilities, particularly those that record radar returns, will be the subject of study and guidance regarding their potential use to an investigation.

3.1.2.12 Examination of relevant maintenance documents

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 he must also learn to determine the adequacy of the specified maintenance procedures.

3.1.2.13 Fires and explosions

The evidence available to distinguish an in-flight fire or explosion from post-accident fires forms a valuable lesson that will be passed on to the trainees. 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.

3.1.2.14 Survival aspects

The chances of occupants surviving an accident can be assessed and the means to do so will be given. They will know the formulae for impact force calculations and the various forms of attenuating impact forces. A discussion on the limits of human tolerance to heat and impact forces is worthwhile, as are the effects of toxic by-products of the accident environment. The efficiency of the rescue and firefighting services, standard pre-flight passenger briefing spiels, restraint systems, seat anchorages and aids to egress from the aircraft is items that will be studied under this heading. It is also very important to review the factors that affect the occupants' chances of surviving the accident. The means of determining the after effects of a fire on the occupants and the fire's impediment to passenger evacuation will be discussed, as must the availability of such items as smoke hoods and smoke goggles. An understanding of the methods used to protect the aircraft occupants from the impact forces and post-impact effects (such as thermal stress and water immersion) is very important for the accident investigator. He must be able to assess the effectiveness of the methods and make recommendations which will provide better protection for the occupants in the future.

3.1.2.15 Structures

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 will comprise metallurgy, fiber reinforced plastics and timber structures, stress analysis and the strength of these materials. It will 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 important considerations. The various types of flight controls and landing gear structures will also be studied under this heading. This section of the syllabus will 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 will be made to provide examples of the various failure modes in materials used in aircraft construction.

3.1.2.16 Systems

Aircraft systems vary from mechanical controls that are still found in general aviation aircraft to the fly-by-wire systems already extant in wide-bodied transport aircraft. There are a wide variety of systems that the investigator should become familiar with in general terms. However, the focus will 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 to system health can often be found in past maintenance records or on-board recorders. In general terms, fuel, hydraulic, pneumatic, electrical, pressurization, flight control, instruments, navigation, autopilot and instrument systems will be discussed. Other topics that will be considered include software failures in

airborne computers and the adequacy of the protection against catastrophic events ensuing from such failures.

3.1.2.17 Aerodynamics

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 will 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, icing and stability also deserve special attention.

3.1.2.18 Power plants

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.

3.1.2.19 Rotary wing aircraft

A general introduction to the principles of flight for helicopters and their control systems is relevant. However the subject of investigating helicopter and other rotary wing aircraft accidents will be a separate specialty course.

3.1.2.20 Organizational information

Organizational and management information is a section of the final report format and it concerns the organizations and the management involved in influencing the operation of the aircraft. The organizations include, for example, the operator; the air traffic services, airway, aerodrome and weather service agencies; and the regulatory authority. Conducting a 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 will 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 which may have a direct bearing on the accident, such as acceptance of inadequate flight crew qualifications; deficient guidance material; maintenance shortcuts; improper crew roistering; failure to provide proper training in aircraft type; shortcomings in crew resource management; 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 is a requirement of a well-rounded accident investigation course. An examination of the means of supervision is very important and will include a review of orders, regulations, manuals and independent audits as well as the performance of supervisors, instructors and company management.

3.1.2.21 Human performance

No accident investigation can be complete without a thorough consideration of Human Factors issues involved. The demands of the environment and the aircraft on the human 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, 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 will encompass the areas of operations and training.

- The area of operations includes the man-machine relationship and the actions or lack of actions in the events leading to the accident. The investigation in this area covers specifically how the flight crew members reacted, analyzed and attempted to cope with the complexities of the flight.
- The area of training will cover the extent and adequacy of the training relevant to the accident flight. The Manual of Civil Aviation Medicine (Doc 8984), the Human Factors Training Manual (Doc 9683), the Human Factors Guidelines for Air Traffic Management (ATM) Systems (Doc 9758) and the Human Factors Guidelines for Safety Audits Manual (Doc 9806) are references which will be used in this section of the training.

3.1.2.22 Determination of the flight crew's suitability for the flight

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 will be explained in detail.

3.1.2.23 Methods of analyzing the factual information gathered

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

3.1.2.24 Report writing

Report writing is an integral responsibility of an accident investigator. ICAO has developed a format for writing reports that leads logically from the history of the flight to the safety recommendations. There is a minimum of duplication and a full consideration of aspects of the flight that are relevant to the improvement of safety. Knowledge of this format and process gives the investigator a sound basis for drafting the final report, including the formulation of appropriate safety recommendations.

3.1.2.25 The news media and public relations

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 more specialized approach to the survivors and the families of those involved in an accident. The importance of keeping others informed on the progress of an investigation, while not speculating as to causes and protecting the privacy of those who assist with sensitive information must be explained to investigators. The Guidance on Assistance to Aircraft Accident Victims and their Families (Cir 285) is a sound basis for addressing this subject and will be used during training.

3.2 Advanced course

Most topics covered in the basic course will also apply to advanced courses, but the instructors will vary their treatment of these topics to suit the purpose of the course and the experience level of the officers for that batch.

In general, an advanced course is desirable for preparing an investigator for the responsibilities of group leader or investigator-in-charge of a major investigation. Such a course will aim to give the investigator an understanding of and some competence in the organization of a major accident investigation.

In addition to the review of the organization of a major investigation, topics that will be discussed include:

- the provision of family assistance to those involved in an accident;
- relations with the media;
- an introduction to methods for cataloguing a large number of fragments of wreckage;
- management of a large accident site for security, safety and protection of the personnel;
- preparation of briefings and answers to formal questions for members of government;
- the methods of undertaking investigations that involve both civil and military aircraft; and
- liaison with the law enforcement authorities in accidents involving unlawful interference.

Other specific subjects which should be included in advanced courses include:

- techniques used to investigate accident damaged systems that involve specialized technologies such as glass cockpit, fly-by-wire systems, GPS, and enhanced ground proximity warning systems (EGPWS);
- reconstruction of evidence recorded in damaged solid state recorders;
- the use of virtual video presentations in large structural reconstructions of wreckage; and
- the use of computer simulations and programs for flight simulators to recreate aspects of the aircraft‘s flight path which are of interest to the investigation.

3.3 SPECIALTY COURSES

AAIB will contact the manufacturers of systems for specialty courses, since most manufacturers have their own accident investigators and support personnel that are familiar with the systems and the investigation techniques required to extract the information stored in the systems. Similarly for other specialty courses arrangements will be made with other State authorities. Specialty courses will be introduced to an officer at any stage after a basic course. The courses would augment the skills and knowledge acquired by the investigator in order to meet the needs of a particular area of accident investigation that is relevant to his assigned duties.

For topics such as helicopter accident investigation, gas turbine engine accident investigation, accident survival aspects, fires and explosions, Human Factor investigation, family assistance and media relations, they are generally extensive enough to warrant a short course of their own with a specialized syllabus.

Description of the systems involving specialized technologies (such as glass cockpit, fly-by-wire systems, GPS, electronic flight instrument system (EFIS) and EGPWS) is usually provided during aircraft type courses. However, aircraft type courses do not include the investigation aspects or the investigation techniques of such complex systems. Extensive information can be obtained from memory chips and other solid state electronic circuits used in new technology systems. Increasingly, the investigation techniques for solid state electronic circuits are covered in accident investigation courses.

CHAPTER 4. RECCURENT TRAINING AND TRAINING RECORDS

4.1 Recurrent training

All officers of AAIB will be provided a recurrent training once in three years period. The curriculum for a recurrent training may be from 3 to 5 days and will aim to update the knowledge of participants with latest techniques, amendments in procedure manual, technologies, regulations etc. The recurrent training will be conducted in house by senior officers to whom specific topics will be assigned by Director and General Investigator AAIB.

Recurrent training of empaneled experts will be carried out every three years. In addition to the training of AAIB officers, case histories of important/complex investigations will be discussed and analyzed. For the sake of logistic convenience, recurrent training of AAIB officers and empaneled experts will be combined.

4.2 Training records

Administration Officer will maintain training dossiers of all AAIB officers and empaneled experts. All officers and experts should also keep updated records of their training. It will be the responsibility of officers/experts to provide copies of certificates of training by them to Administration Officer for maintenance of records.

4.3 Training records of investigators

Name of the Officer	Name of Seminar/Course/Workshop/ Conference/Meeting	Country	Duration
2015			
Mr. Narankhuu Khand, Mrs. Gerelchimeg Purev	Flight Recorder Readout workshop /BUR1-2G/	Russia, Moscow	28 Mar-04 Apr , 2015
2014			
Mr. Tsolmon Jigjid	Meeting of Leaderships /the Ministry of Transportation and Communication of Kazakhstan and the Ministry of Road and Transport Mongolia/	Kazakhstan, Astana	05-10 Apr, 2014 6 days
Mr. Tsolmon Jigjid	2nd Accident Incident Investigation and reporting meeting	China, Beijing	26 May to 01 Jun, 2014 7 days
Mr.Uuganbayar Ariunmaa	English Language	Mongolia, Terabyte TC	17 Feb-14 Mar, 2014 26 days
Mr. Bat-Orshikh Ovgor Mr.Uuganbayar Ariunmaa	2nd Accident Incident Investigation meeting APA	China, Hong-Kong	25 May-01 Jun, 2014 1 week
Mr. Bat-Orshikh Ovgor	Aircraft Accident Investigation Management	Singapore	24 Sep-01 Oct, 2014 1 week
2013			
Mr.Battulga Baatarsuren	ISASI Annual Seminar	Spain, Madrid	14-19 Apr, 2013
Mr. Tsolmon Jigjid	Aircraft Accident Investigation Workshop	Indonesia, Bali	16-20 Sep, 2013
Mr. Tsolmon Jigjid	Aircraft Accident Investigation Management meeting	China, Beijing	22-26 Sep, 2013
Mr. Tsolmon Jigjid, Mr. Bat-Orshikh Ovgor	Investigation meeting	Russia, Moscow	08-16 Dec, 2013
Mr. Bat-Orshikh Ovgor Mr. Enkhchuluun Ishjamts Mrs.Gerelchimeg Purev Mr.Battulga Sarankhuu	Aircraft Accident Investigation Prevention workshop and Blood borne pathogens	Korea, Seoul	08-12 Apr, 2013
Mr. Bat-Orshikh Ovgor	Aircraft Incident Investigation	Korea, Seoul	13-18 Apr, 2013
Mr. Bat-Orshikh Ovgor	Aircraft Incident Investigation	Korea, Seoul	28 Apr-03 May, 2013
Mrs. Erdenezaya Jugder	English Language	China, Hong-Kong	10 Jun-10 Jul, 2013

			1 month
Mr. Narankhuu Khand,	Aircraft Investigation	USA, Woburn	10-13 Dec, 2013
Mr.Battulga Sarankhuu Mr.Uuganbayar Ariunmaa	IT , Network, Security	Mongolia, Data center	Nov-Dec, 2013
Mrs. Oyun Aleksandr	English Language	Mongolia, Terabyte TC	09 Dec, 2013 31 Jan, 2014 2 months

2012

Mrs. Oyun Aleksandr	English Language	Mongolia, Dined Mongol TC	12 May-12 Aug, 2012 3 months
Mrs. Oyun Aleksandr	Seminar on Human Resource Management	Korea, Seoul	27 May-03 Jun, 2012 1 week
Mrs. Oyun Aleksandr	English Language	Mongolia, Magic Choice TC	26 Nov, 2012 3 months
Mr.Battulga Sarankhuu	English Language	Mongolia, K many TC	01 Dec, 2012 45 days
Mrs. Erdenezaya Jugder	English Language	Mongolia, Santis TC	03 Dec, 2012 3 months
Mr. Bekhbat Tumurdavaa, Mr. Battulga Baatarsuren	Flight Recorder Readout workshop /UFDR,A100/	China, Beijing	17-22 Apr, 2012 1 week
Mr. Narankhuu Khand, Mr. Bat-Orshikh Ovgor	ISASI Annual Seminar	USA, Baltimore	27-30 Aug, 2012
Mrs. Gerelchimeg Purev	Flight data Analysis	Canada, Ottawa	09-12 Oct, 2012 4 days

2011

Mrs. Oyun Aleksandr	English Language	Mongolia, Dined Mongol TC	12 Dec, 2011-11 Mar, 2012 3 months
Mr. Battulga Baatarsuren	Aircraft Accident Investigation and Management	Singapore	19 Jun-02 Jul, 2011 2 weeks
Mr. Narankhuu Khand, Mr. Battulga Baatarsuren	ISASI Annual Seminar	USA, Saltlake	12-16 Sep, 2011
Mrs. Gerelchimeg Purev	Flight Data Readout Equipment	USA, Olate	20-23 Sep, 2011

			3 days
Mr. Narankhuu Khand, Mrs. Erdenezaya Jigder	ECCAIRS Software and user training	United Arab Emirates, Dubai	08-20 May, 2011 2 weeks

2010

Mr. Narankhuu Khand, Mr. Altankhuyag Namsrai	Aircraft Accident Investigation course	USA, Torrance	13-27 Feb, 2010 2 weeks
Mr.Baatarjav Munkhjargal	Aircraft Accident Investigation course	Singapore	08-19 Mar, 2010 2 weeks
Mrs. Gerelchimeg Purev	Insight Analysis 3.0 software	USA, Torrance	27 Sep-04 Oct, 2010 5 days
Mrs. Oyun Aleksandr	Archive records development	Mongolia, Archive TC	19-21 Oct, 2010 3 days
Mrs. Oyun Aleksandr	Theory and methodology of records and archives	Mongolia, Archive TC	01-25 Nov, 2010 25 days

CHAPTER 5. PREPARATION

5.1 Personal Equipment

- **Identification.** Rescue and law enforcement personnel may question your presence and participation at the accident scene. The investigator should ensure proper identification is carried as well as personal identification (business) cards that can be distributed to significant personnel.
- **Means of financial security.** Often the investigator will need to stay near the accident site for several days and require a hotel room, food, clothing etc. Bring a credit card or voucher and cash money.
- **Appropriate clothing.** Consideration should be given to the environment (temperature, weather, insects, terrain and footing).
- **Head covering.** Provides protection from the sun.
- **Work Gloves.** Aircraft wreckage can cause harm.
- **Latex Gloves.** Provides protection from blood borne pathogens and human remains.
- **Sunscreen and insect repellant.**
- **First Aid Kit.** Bandages, aspirin, Vicks nasal rub, hydrogen peroxide etc.
- **Food and Water.**

5.2 Photograph Equipment

- **Camera.** Preferably a digital camera with fresh batteries and large memory card. A 35mm single lens reflex (SLR) camera will also work fine. The investigator should become familiar with the photograph equipment and its features prior to employment.
- **Ruler.** Used as a size reference item.
- **Notebook and pencil.** Used as a photo log and significant note recall.
- **Non-permanent marker & masking tape.** Used to non-intrusively identify wreckage components within photographs.
- **Spare camera and batteries.** Assume equipment failure and have a backup.
- **Protective case.** Provides equipment protection from inclement weather etc.

5.3 Diagram Equipment

- **Ruled paper.** Preferably quad ruled, used to make sketches.
- **Compass.** Provides magnetic reference for critical items.
- **Protractor.** Used as a geometric tool to provide angles.
- **Pencils with sharpener.**
- **100' measuring tape.** Preferably cloth (metal will suffice) and in good working order.

5.4 Interview Equipment

- **Compact tape recorder with new tape and fresh batteries.** Used to capture witness recall (testimony) verbatim.
- **Spare tape and batteries.** Used as a backup and/or replacement.
- **Model aircraft.** Provide a generic compact model that can be used as a visual aid for witnesses unfamiliar with aircraft flight and components.
- **Notebook, pencil and sharpener.** Used to take notes.

5.5 Evidence Collection Equipment

- **Sterile containers.** Used to collect perishable evidence (i.e. fuel and oil samples etc.).
- **Tape measure.** Preferably 25' and steel. Used to measure short distances between significant components at the accident site.
- **Mirror.** Preferably compact with an adjustable arm. Used to view evidence without disturbing wreckage.
- **Flashlight with spare batteries.** Provides lighting for internal components.
- **Magnifying glass.** Aircraft wreckage is often miniscule. Used as an aid to identify aircraft parts.

All of the previously identified items should be transported and protected in a light weight protective bag or case. As aircraft accidents often happen in remote locations, the equipment may need to be carried long distances over difficult terrain. When assembling the field equipment kit, the investigator should strive to be thorough yet efficient at all times.

CHAPTER 6. ARRIVAL

Once notified of the aviation mishap but prior to arrival on scene, the investigator should gather as much information as possible on the type of aircraft involved in the accident. At a minimum, collect a diagram or picture of the aircraft type. This will serve to provide overall perspective of the aircraft design and assist with location of parts within the wreckage. If readily available, gather a Flight Manual (FM) or Pilot Operating Handbook (POH).

6.1 General Rules

Upon first arrival on scene of an aircraft accident, a few steps should be taken to ensure good order and discipline throughout the field investigation. The following list provides recommended actions taken by the investigator to assist in providing a smooth field operation:

- Do not interfere with ongoing rescue efforts. The investigation is secondary to the rescue effort and the saving of human lives. Assist as necessary and/or observe the rescue effort and its effects on the aircraft wreckage and surrounding evidence.
- Establish a base of operations. Choose a protected area physically located away from the accident site that provides a place out of the elements. Used to psychologically decompress, eat, converse etc.
- Inventory personnel resources. Identify all individuals that will be assisting with the investigation effort and their experience with such matters.
- Establish a relationship with on scene local authorities. Introduce investigative party to law enforcement personnel; coroner etc.
- Establish safety rules. Remember accident scenes are hazardous places. Brief personnel on use of safety equipment and don't allow anyone to get hurt. An injured investigator is a liability and can impede the investigation effort. Some of the hazards at the accident site may include:
  - Chemical – fuel, hydraulic fluid, oxygen tanks and oil.
  - Pressure vessels – tires, fire extinguishers and accumulators.
  - Mechanical – springs, landing gear door and drag chutes.
  - Pyrotechnic – ejection seats, munitions and survival equipment (flares etc.).
  - Hygiene – blood borne pathogens and human remains.
  - Fumes, dust and vapors – resultants from burning of composite and synthetic materials.
- Look at everything, and then preserve the evidence. A good investigator never jumps to conclusions. Study and preserve the evidence as primarily a fact-finding effort. Time will be afforded in the future to conduct analysis of the evidence gathered.

6.2 Site Survey

Conduct an initial walkthrough. This provides overall perspective of the accident scene. Do not move any parts of the wreckage during the walkthrough. Identify the initial impact point of the aircraft with the surrounding environment and the progression of the aircraft following impact. The walkthrough provides an opportunity to gather "big picture" information prior to the detailed work conducted on scene. Spend at least 30 minutes just looking and gaining a feel for the scope of the event. Form AAIPU-AIFN-01 Accident Investigation Field Notes is used to document thoroughly the scene of any accident and should be used at all times when possible

CHAPTER 7. ON SCENE

7.1 Actions

Find the "4 corners" of the aircraft. Inventory the wreckage starting with the nose, tail and all wing tips. Account for all the parts of the aircraft at the accident scene. If an aircraft part (or parts) is missing, they must be accounted for elsewhere. Start at the outside of the wreckage and work in toward the center. This may be the first opportunity to identify something that should not be in the wreckage such as a tool or part of another aircraft. Determine general debris pattern and logistics required to eventually remove the wreckage.

Take initial photographs. Initial photographs should be taken of the four cardinal and intermediate points of the wreckage as it lay on the ground. Start with the nose of the aircraft (considered north) and work clockwise taking the eight photos (N, NE, E, SE, S, SW, W, NW) at approximately the same distance from the center mass of the aircraft. This provides a good opportunity to identify known aircraft and/or human parts.

Collect perishable evidence.

Fuel samples – collect samples from tank drains, fuel lines or the tank itself. Take samples from as many points as possible. Store and label samples in sterile containers. If fuel contamination is suspected, eventually collect samples from the fuel source (truck, underground tank etc.) and other aircraft fueled from the same source.

Oil and hydraulic fluid samples – collect samples from the reservoir or pressure lines. Store and label in sterile containers.

Evidence of icing – if the environment is conducive to in-flight icing, collect evidence of both structural or power decrement icing.

Switch positions and instrument readings – people will move switches and change instrument readings. Preserve their original impact positions as soon as possible.

Control surface and trim tab positions – impact positions will be changed (tested) during the investigation.

Flight data recorders and cockpit voice recorders – should be located and retrieved as soon as possible as they will require laboratory analysis. Electronic witness evidence can serve as an excellent source of evidence. Flight data recorders (FDR) are considered required equipment for Federal Aviation Regulations Part 121 and some Part 135 operations.

Charts and papers – collect before they blow away or are subjected to environmental conditions. Of particular interest are flight plans, recorded (text) weather briefs, weight and balance calculations etc.

Determine type of accident impact. All aircraft land impacts can be categorized in five different types. Calculate the relative velocity and impact angle of the accident.

High velocity/High angle; described as the proverbial "smoking hole". Depending on the terrain, the aircraft created a deep hole with most of the wreckage still inside or in the immediate vicinity. The earth that was originally in the hole is located around the crater with the majority of earth located outside the hole in the direction of flight. The bulk of the wreckage distribution will also be located in the direction the plane was going.
Although it rarely ever happens, an exactly vertical impact will display a symmetrical ring of earth (and wreckage) around the hole.

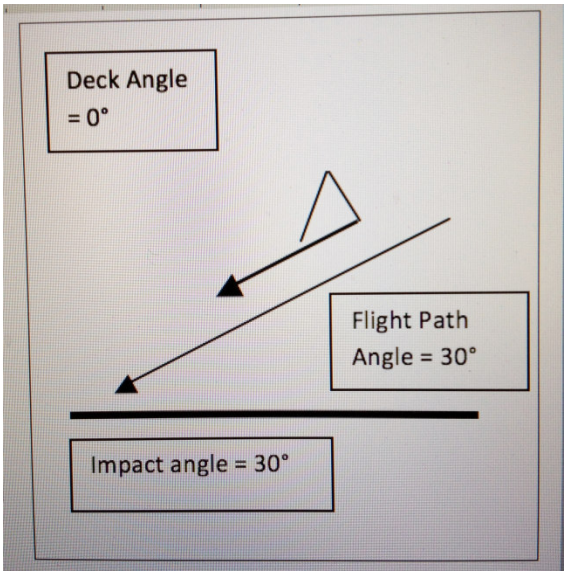
High velocity/Low angle; wreckage is spread across a large area of land. Identified by an initial impact scar followed by a fan shaped distribution of wreckage from that point. Because of their mass, the heaviest portions of the aircraft will travel the furthest (energy physics). Distribution of wreckage can be affected by local winds. Lightweight parts can be blown downwind upon separation from the aircraft. Due to their mass, the engines often provide evidence of the impact heading. A line drawn from the impact point to the engines will usually assist in identifying the magnetic impact heading.

Low velocity/High angle; the impact crater will be shallow and the plane will be largely intact. Since the tail has quite a bit of mass, it is not unusual for the tail (horizontal and vertical stabilizers) to separate from the rest of the aircraft and travel further than the rest of the airplane. Depending on the impact angle, the tail may go over the top or under the bottom of the rest of the plane. This often buckles the aft fuselage in the process.

Low velocity/Low angle; hitting at a fairly low angle, the aircraft may have bounced, hit again and bounced several times. In the process, it may shed components of the aircraft (wings, engines etc.) but the final product still looks like an aircraft. The mass destruction of high velocity impact is not evident. Common scenario for landing approach accidents.

Stall/Spin impacts; essentially low velocity/high angle impacts with rotation at moment of crash.

Determine flight path of aircraft. Use supporting evidence to determine the direction of flight path the aircraft flew prior to impacting the ground. The impact angle is the flight path angle of the aircraft adjusted for the pitch attitude of the aircraft. If the terrain is not level, the grade must be considered also. Impact angle is what the plane actually feels when it hits the ground and thus becomes the algebraic sum of the flight path angle and the terrain angle.



Drawing 7.1.1

Identify all ground scars associated with accident. Walk both up and down the final flight path. Identify pre and post impact markings within the surrounding environment (ground, trees, buildings etc.)

Take supporting photographs. As a general rule, the investigator should photograph everything. Leave nothing to the memory alone. Photograph and document each item before it is touched or moved. Never move a component within the wreckage until it is preserved. The photographs will serve to:

- Preserve the evidence
- Capture the volatile scene
- Serve as a memory aid
- Support the final report
- Provide a visual representation of what happened.

The investigator should note the time of day that each series of pictures were taken and record it in the photo log. This will provide a chronological recreation of the fieldwork during the analysis phase of the investigation as well as an understanding of each photograph's shadowing characteristics. When size context of a component is desired, use a ruler to provide reference within the picture. All photos should be color formatted and taken on high resolution. The investigator should work to gather pictures of:

- The overall scene (including overview if possible)
- Cardinal and intermediate points
- Impact point and ground scars
- Aircraft structures (wings, fuselage, system components etc.)
- Damage and debris
- Survival space and blood contact points
- Environmental surroundings (trees, power lines etc.).

Additional photographs may be available from external sources following the aircraft accident. If available, gather all photographic evidence from the following means: Crash/fire responders, Law enforcement, Witnesses, Pathologists and Media.

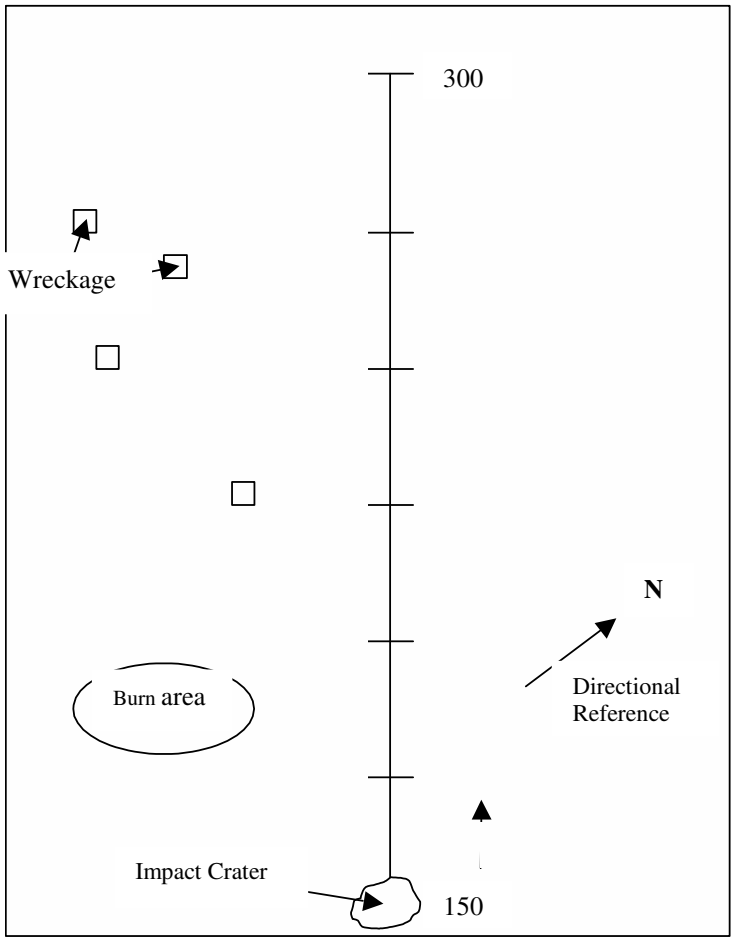
Commence a wreckage diagram. Plot the location of the impact and the subsequent distribution of the wreckage. Useful information typically found on the diagram includes:

- Location references (runways, buildings, roads etc.)
- Direction reference
- Scale
- Contours and elevations
- Ground scars
- Impact heading
- Final position of major components
- Burn areas

- Location of eyewitnesses

The primary purpose of any wreckage diagram is to preserve evidence and visually show the final position and relative relationship among critical aircraft components. A good wreckage diagram is essential to most calculations involving crash dynamics and survivability. However, diagrams tend to be labor intensive. If a diagram is included in the report, it should serve a purpose. If it doesn't, then don't include one. If a diagram adds value, determine which type is most appropriate for the accident. Types of wreckage diagrams include:

Stake line system – simplest of all diagramming systems. Start by establishing a point of reference that can be located on a map (or identified with GPS coordinates). Determine origin of stake line (usually located at impact crater) and run a line through the wreckage. Using a tape measure, place stakes every 50 feet and mark each with the distance from the starting point. Measure the compass (magnetic) heading of the stake line. Locate each major piece of wreckage as a distance down the line and a distance perpendicular right/left from the stake line. Distances between stakes can be measured or estimated. Identify each piece of wreckage followed by distance down, right or left and perpendicular to the stake line. As an example, LMLG 150 L 20 would mean the left main landing gear was located 150 feet down the line and 20 feet left of it.

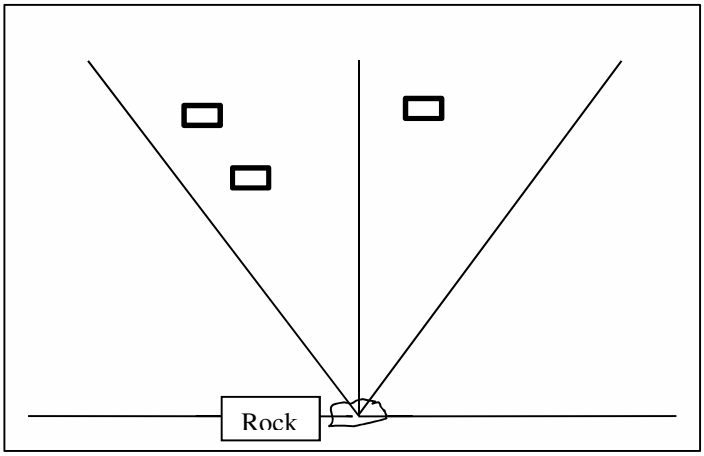


Drawing 7.1.2. Stake Line Diagram

Grid system – used for large crash scenes with difficult terrain. Using a map or chart of the accident area, overlay the wreckage with a grid. Each grid square is numbered and the wreckage within each square can be identified. Used for the space shuttle Columbia accident.

Polar system – used for compact wreckage area. Establish a stake or pole in the center of the wreckage and extend lines in cardinal compass directions from the center stake. Mark each line with distances and plot each piece of wreckage as a direction and distance from the center stake. This is the method commonly used to plot underwater wreckage with the salvage ship as the center.

Single point system – similar to the polar system except the stake is placed at the impact point or a referenced cultural feature. The lines are extended through the wreckage in a pie-shaped fashion and the wreckage is plotted as a direction and distance from the stake.



Drawing 7.1.3. Single Point System

Distinguish between causal and resultant damage.

Distinguishing between causal factors (directly responsible for the accident) and resultant damage (occurring as a result of the causal factors) may be the most critical element to preventing future accidents from recurring. Damage occurring during the impact with the ground (crash) is by definition resultant in nature. As the detailed examination of the physical components is conducted, attempt to determine whether the damage was causal or resultant and how it fits into the accident sequence.

Conduct detailed examination of physical evidence.

Using a system-based approach, examine each of the primary subsystems of the aircraft for causal and/or resultant damage. Keep in mind, the investigation is still within the fact-finding stage; be cautious not to commence analysis of the accident while operating in the field.

Propulsion System - approximately 20 – 25% of aircraft accidents involve a propulsion issue. However, propulsion issues by themselves do not cause an aircraft to crash. Look at the entire system and do not rely on one piece of physical evidence alone. Gather information to support what role (if any) the propulsion system contributed to the accident sequence. Locate the engine(s) on scene and determine how much power they were producing (or capable of producing) at

impact. The engine may require teardown (conducted by a professional A&P) to determine functionality of internal components.

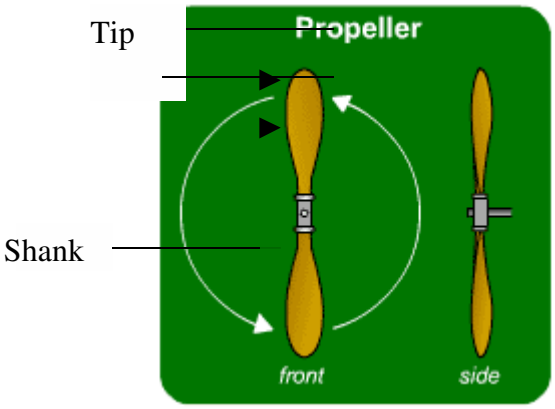
Do not attempt to perform an engine teardown on scene. Ensure the following engine items are preserved while on scene:

- Power setting
- Rotational damage to compressor / turbine
- Heat energy
- Recording devices
- Engine controls / variable inlet guide actuators
- Fuel control / throttle position / mixture controls
- Instruments
- Mounts/attachments
- Accessory gearboxes / engine accessories

Reciprocating Engines

Propeller Blades - blade deformations often provide a power signature to the investigator. The five basic types of deformations are:

- **Fractures –** breaks that occur on the propeller blade usually from impact with a hard surface. Blade fractures may occur prior to impact (metal fatigue). If possible, locate the fractured components and record proximate vicinity to the wreckage.
- **Scratches –** cross sectional erosions on the propeller blades. Chord-wise scratches indicate rotation at impact while lengthwise scratches are a non-rotational deformation.
- **Gouges –** chunks taken out of propeller blades usually occurring on the blade's leading edge. Serve as a rotational signature.
- **Bends –** changes in the axis of the blade. Bends may occur rearward, forward or in an "S" shape and typically indicate a low power setting.
- **Twists –** deformation around long axis of blade. Usually indicate high power setting.



Drawing 7.1.4.

Fuel system – half of all power related malfunctions involve fuel issues. Determine whether there was fuel available. Start by looking for evidence of fuel on scene (liquid fuel, fire and odor). If fuel was not available, determine whether fuel exhaustion (no usable fuel) or fuel starvation (fuel available but not getting to engine) was a primary factor. Investigate the following items:

- Fuel quantity
- Valves / controls / linkages / transfer subsystems
- Plumbing lines
- Fuel quality

Ignition system – three major components of a reciprocating engine ignition system: magneto, wiring harness and spark plugs. Inspect each component for possible failure.

Air supply – inlet (carbureted vs. injected) and exhaust. Inspect each component and condition.

Oil supply – used to reduce friction and heat within the internal components of the engine. Look for physical evidence on scene (samples, pooling etc.). Inspect components and determine integrity and functionality of the system. Ensure the following oil supply items are addressed:

- Quantity
- Quality
- Valves / controls / linkages
- Pumps
- Filters / screens
- Plumbing lines

Mechanical condition– performed by a licensed aircraft mechanic. Inspect physical components (rods, pistons, crankshaft etc.) for serviceability.

Jet Engines

There are four types of jet propulsion engines. They are: the Turbojet, Turbofan, Turbo-shaft or Turbo-prop. Determine which type of engine the accident aircraft was equipped with at the time of the crash. Once again, investigate using a systems based approach.

Fuel system – Given the higher flashpoint of its fuel, jet engines have a decreased propensity for in-flight fire. Determine whether there was fuel available. Start by looking for evidence of fuel on scene (liquid fuel, fire and odor). If fuel was not available, determine whether fuel exhaustion (no usable fuel) or fuel starvation (fuel available but not getting to engine) was a propulsion issue.

Air supply – Jet engines have a tendency to ingest foreign objects. Inspect each component of the compression, combustion and exhaust systems for signs of foreign object debris/damage (FOD). Identify source.

Oil supply – used to reduce friction and heat within the internal components of the engine. Look for physical evidence on scene (samples, pooling etc.). Inspect components and determine integrity and function ability of the system.

Mechanical condition — performed by a licensed aircraft mechanic. Inspect physical components (blades, stators, compressor, combustion chamber etc.) for serviceability.

Structural Failure

Material or structural issues have been identified in approximately 15% of aircraft accidents. The manner in which a material reacts to a load can best be identified and evaluated in the material's stress/strain characteristics. Research the material properties of the structural component in question. In the aviation industry, exposure of a component is typically measured as a function of time (operating hours) or cycles (repeated use). Determine the design service life of a suspect component with the actual operating exposure of the material. The maintenance history of the aircraft can assist with this determination. Components break for a reason and that reason must be determined. The characteristics of each material are typically classified into five categories:

- Strength – ability to resist force
- Hardness – ability to resist deformation
- Elasticity – degree to which material can deform without change
- Durability – ability to resist change with exposure (time/cycles)
- Weight – gravitational effect on material.

The majority of structural failures can be classified into two categories; either instantaneous (happening all at once) or progressive (occurring over time). Instantaneous failures are typically a result from either (1) an overload, (2) an under design or (3) a metallurgic defect. Progressive failures on the other hand, are typed as follows:

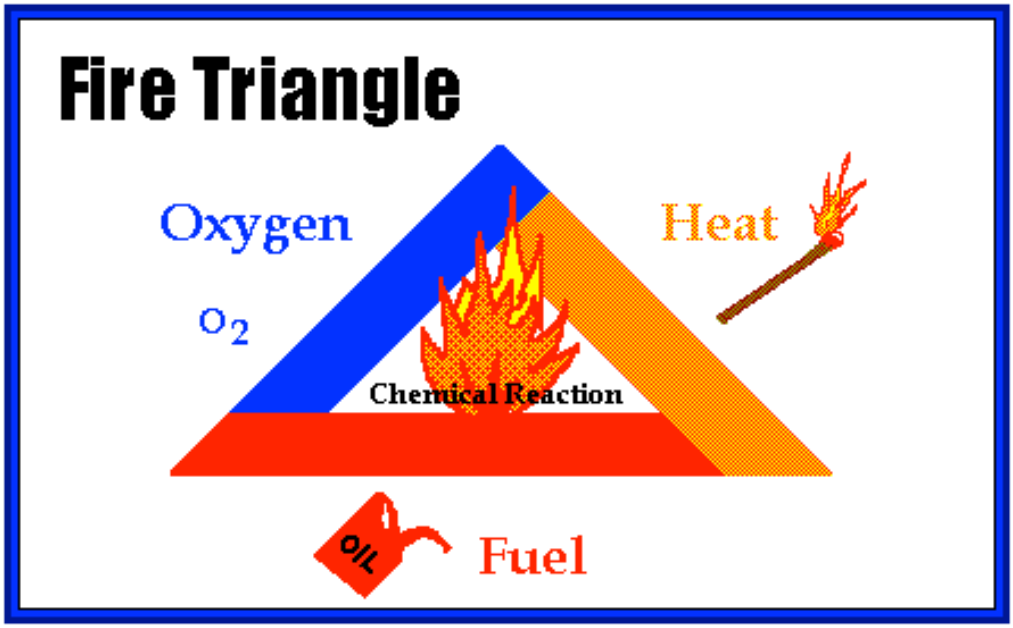
- **Fatigue –** there are two types of structural fatigue; either low stress/high cycle fatigue or high stress/low cycle fatigue. Each type requires a stress riser, cyclic loading, local tension stress and local plastic deformation. If suspected, determine which type of fatigue occurred.
- **Corrosion –** an electrochemical process usually working in conjunction with fatigue. Corrosion occurs when a material is exposed to the environment and because of that environment breaks down over time. Corrosion requires an anode, a relative cathode, a conductive path and conductive flow.
- **Wear –** interacting surfaces produce friction and heat. Aircraft are designed and built with the knowledge that most components will "wear out" and eventually fail over time. This is referred to as "normal wear" and is fairly predictable. Normal wear components are scheduled to be replaced at predetermined intervals as identified by the manufacturer. Refer to maintenance records. Abnormal wear, on the other hand, occurs between parts that are not designed to be in contact with each other. By their nature, aircraft produce a great amount of vibration while operating. Often components such as control cables or fuel lines may intrude into areas they were not designed to operate within. Search for areas of wear within suspect components.

- **Creep –** damage resulting from a centrifugal process and usually occurring within the propulsion system. There are five basic methods in which a structure can fail, they are:
  - Tension
  - Compression
  - Bending
  - Torsion
  - Shear

Complete the detailed field examination of components using the systems based approach. The following subsystems of the accident aircraft should be inspected:

- Inspect the **Airframe** for the following:
  - Flight controls / cable continuity
  - Landing gear
  - Flaps / slats
  - Control surfaces
  - Fuel cells / lines
  - Fuselage
  - Wings
  - Cockpit / instruments
- Inspect the **Hydraulic system** for the following:
  - Quantity
  - Quality
  - Valves / controls / linkages
  - Pumps
  - Filters / screens
  - Plumbing lines
- Inspect the **Electrical system** for the following:
  - Shorts
  - Switch positions
  - Circuit breakers
  - Generators
  - Light bulb analysis
- Inspect the Instrumentation system:
  - Instrument readings captured
  - AC powered instrument readings
- Inspect the **Life Support system**:
  - O2 system
  - Seats, seat belts, harnesses

Fire



Fire can either be the cause of an accident or the result from it. Basic fire chemistry defines fire as an exothermic, pyrolytic oxidation reaction. In order for it to occur, four elements must be present: a combustible material, an oxidizer, an ignition source and enough heat or energy to sustain the reaction.

Often fire damage hinders the investigator's efforts by altering individual components and systems. If fire is present, aircraft parts may be changed through:

- Mechanical changes to wreckage
- Chemical changes to wreckage
- Thermal changes to wreckage

However, fire damage can assist in determining whether fuel exhaustion or fuel starvation served as a causal factor to the accident. Distinguish between in-flight and post-impact fire. Approach the fire investigation much the same way as the basic, overall accident investigation. You are trying to answer these basic questions:

- Where did the fire start?
- How did the fire start?
- Where did it go?
- What did it do?

There are four classifications of fire:

- Class A – Organic Solid fire. A relatively low order fire. Typically fueled by organic solids (wood, paper etc.). Class A fires are the slowest and coolest burning of the four classifications.
- Class B – flammable liquid fires. A relatively high order fire.

- Class C – Electrical fires. Hottest classification of fire but relatively easiest to stop. Class C fires often evolve into Class A or B fires if not located and isolated immediately.
- Class D – Flammable metal fire. Common material used in aircraft producing a Class D fire is magnesium used in landing gear and engine assemblies.

Some basic rules to keep in mind:

- Parts subjected to in flight fires may be more severely burned that parts subjected to ground fires only.
- Look for in flight fire evidence on parts not subjected to ground fires
- Secondary or post impact fires may destroy evidence of pre impact fires.
- Melting temperatures of materials will establish minimum exposure temperatures.
- Aluminum heated to near molten state and then shock loaded will broom straw.
- Look for molten metal droplets/globs along final flight-path. This indicates pre-impact fire is likely.
- Ground fire soot and smoke deposit patterns will be generally upward.
- Pre-impact soot and smoke deposits will follow airflow. Look for laminar deposits and clear spots downwind of ribets, splices and obstructions.
- Soot will not normally attach to surfaces over about 700 deg F.
- Bright or clean scratch marks, scuffs, or smears in the soot pattern indicate they were made after the soot attached.
- Soot in fracture ends or protected surfaces, indicates fire after damage occurred.
- Soot and discoloration may be due to aircraft operation.
- Parts protected by water/dirt may not show fire damage.
- Ground fire patterns may have branches, twigs or leaves outlined in soot pattern.
- Discoloration of materials is a time/temperature function.
- Be wary of witness information. Fuel/oil released in flight may look like smoke… where there's smoke…
- Internal areas of the aircraft may produce chimney effect.
- Interior cabin materials behavior can help establish isotherm layers and determine vertical temperature gradients in areas not directly burning.
- Fire victims (even fatalities) can tell us a lot about the fire.
- Keep relating information and evidence back to what is already known.
- Don't be afraid to call in fire investigation specialists.

7.2 Witnesses

Time is critical. Eyewitness interviews should be conducted as soon as possible, preferably within the first seventy-two hours of the mishap occurrence. Rarely does a witness to an aircraft accident get the visual opportunity to view the entire accident sequence. Rather, the majority of witnesses available during an investigation only had the opportunity to view small parts of the accident and each witness will have an individual perception of what actually occurred. The initial seventy-two hour time interval provides the chance for the accident investigator to capture information held by a witness before it can be mentally altered. Understand, as human beings we are pre-disposed to cognitively filling in lost information. Given time, most people will subconsciously perform this function.

Witness interviewing is best done on a face-to-face basis in a neutral, comfortable environment. Enlist the assistance of an observer while conducting an interview. This serves two purposes. First, the observer can ensure that critical items have not been missed or neglected from detailed discussion. Second, an observed interview offers another person's perception of the witness's character, demeanor, impairments etc.

There are primarily four types of witnesses to an aircraft accident:

- **Eyewitness –** the eyewitness is an individual that had the potential to perceive some aspect (sight, sound, smell etc.) of the accident sequence. Gathering information from the eyewitness can serve to support physical evidence in the accident sequence. Eyewitnesses can be subdivided into two groups.
  - **Associated –** an individual that had something to do with the accident sequence (i.e. an air-show spectator).
  - **Non-Associated –** by happenstance the witness was in the vicinity of the accident (i.e. driving down the nearest road).
- **Background Witness –** the background witness is a person that did not actually perceive any part of the accident directly but still have information that can assist the investigator to understand the background of the situation. Examples of a background witness include mechanics, dispatch personnel, family members or operator peers.
- **Expert Witness –** the expert witness has no direct relationship with the accident involved. However, this witness possesses greater than average training, experience or knowledge about circumstances surrounding the accident sequence. Examples of expert witnesses are medical examiners, flight training officers, manufacturer's representatives etc.
- **Response Witness –** the response witness is a person (or group of people) that were the first to arrive on scene at the aircraft accident. In the effort to save human lives, response personnel may have altered some of the wreckage from its original impact state. Documenting the details of these changes to the evidence is important to the investigation effort. Also, response witnesses (i.e. law enforcement personnel) may be able to identify and provide a list of potential eyewitnesses.

7.3 Witness Process

There are five stages to the witness process.

- **Finding witnesses –** use all available resources to locate, contact and meet with witnesses to the accident. Consideration should be given to local media (newspaper, radio) advertising if witnesses are not immediately available.
- **Qualifying the witness –** obtain permission from the witness to audio record the interview. Always be non-evasive with the use of a recording device. Place the recorded near the witness but outside of their primary line of sight.
- **Interviewing the witness –** Ask neutral questions, do not lead the witness. The purpose of the interview is to try and understand the witness and what they may have to contribute. Let the witnesses tell their own story. As part of this process, ask amplifying questions to obtain more precise information and the details of their observations. Also, ensure the witness testimony is clarified during the interview. For example, if the witness states that the aircraft "stalled", clarify if the witness observed an actual flight stall or merely an engine stall. Following the interview, ensure the witness is thanked for their assistance and obtain information necessary for future contact. Provide the witness with a business card on the chance they remember further details of the accident. Finally, request the witness to provide a signed and dated written description of their observations. This provides an opportunity to recall events in the accident sequence in a more informal setting.
- **Analysis of witness evidence –** once the witness has departed, "hot wash" the interview with the observer. Discuss both the physical and psychological biases of the witness. Of particular interest should be any physical or perceptual impairment involved in the evidence.
- **Fitting witness evidence into package –** determine how the witness statement supports (or fails to support) the other evidence.

CHAPTER 8. DEPARTURE

8.1 Secure the wreckage.

Properly securing the wreckage provides the investigator with future opportunities to retrieve valuable information. If possible, store the wreckage in a covered facility close to the base of operations and establish security-preventing parts from further alteration. Some considerations while securing the wreckage are:

- Salvage / parts containers
- Weather resistant if possible
- CONX boxes vs smaller containers
- Identified by recovery / grid location zone
- Bag & tag parts

Mechanized Equipment to Move Containers:

- Fork-lift vehicles
- Cranes
- Pay-loaders / bulldozer
- Tracked vehicles
- Possible helicopter lifts if terrain a factor

Reconstruction (can help with failure sequence)

- Large flat area min 1-2 times size of aircraft (an empty hanger is ideal). Forklift access to move larger pieces
- Assembly of identifiable pieces as they were originally positioned on aircraft
- Separate non-Identified parts from identified parts
- If possible, use similar aircraft as exemplar
- Conduct detailed examination of all systems / components
- Identify those parts for further teardown or engineering investigation

8.2 Notify Owner.

The owner or insurance company of the accident aircraft will be notified and information will be gathered as to who will be responsible to clean up and pay for the removal and storage of the wreckage.

Once the inspection and all post examination are complete the wreckage will be released to the owner or insurance company.

CHAPTER 9. CONCLUSION

When conducting an aircraft accident investigation, it is vital for the investigator in charge to employ all available resources while gathering physical evidence to properly understand the full scope of the sequence of events leading to the crash. Collecting and preserving this information within the first 24 hours following an accident will provide the most accurate re-creation of the events leading to the accident.

If resources are available, delegate personnel to gather Airworthiness Directives (ADs), Service Difficulty Reports (SDRs), Air Traffic Control (ATC) communication tapes and radar plots, Flight Service Station (FSS) flight plans, weather briefs and weight and balance information.

Remember, the sole objective of the work involved is to prevent future accidents created by similar cause from recurring. An investigator's focus should not be geared toward assigning culpability for the mishap. Following the Field Investigation, the investigation moves into the analysis phase

ATTENDANCE BOOK

Course No:		Date:	
Course title:			

No	Date Trainee name	First exam Score	Re-exam Score	Attendance /percent/	Score(s)	Result
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						

Examiner's name		Signature	

ATTENDANCE AND EXAMINATION REPORT

Aircraft type:		Start Date:	
Course No:		End Date:	
Course Name:		Duration:	

No	Student name	Days attended	Trainer Hours	Exam Score(s)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Reported by:		Date:	

ASSESSMENT BOOK

Course No:		Duration:	
Course title:			

No	Date / Trainee name			Comment
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Registered by / Signature /				

COURSE FILE REGISTER

Course Title:					
Date Approved:					
Initial Course Package: (Number bundles per listing bellow)					Tick as req'd
1. Course Development Material (As applicable) 2. Course Approval Package (Check against MTOE001) 3. MTOE001 Training Course Approval Checklist					☐ ☐ ☐
Name:		Initials:		Date:	

Course File History				
Nos	Date	Item	Name	Initials
4				
5				
6				
7				
8				
9				
10				

COURSE PRE-DELIVERY CHECKLIST

Course Title:			
Course Start and Finish Date:			
Item	Remarks / Information (N/A if not applicable)	Actioned	Date
Course Plan Reviewed.		☐	
Course Location			
External Provider / Off site? (If YES give details inc address, contacts, travel & accommodation Requirements if applic)		☐	
Instructor			
Part-66 training? (If YES refer to Q&S Manager for approval)		☐	
Amendments required? (If YES give brief details)		☐	
Amendments Completed (MTOE required)		☐	
Course Approval (Refer MTOE)		☐	

Item	Remarks / Information	Actioned	Date
Participants			
Participants Notified		☐	
Departments Notified		☐	
Course Notes Assembled		☐	
Handouts Assembled		☐	
Admin Forms Raised inc Assessments (List as required)		☐	
CD Burnt (Latest Revision)		☐	
Room & Resources Prepared		☐	

Name:		Signature:		Date:	
To be filed with applicable Course material in Course File					

KNOWLEDGE ASSESSMENT

Item:					
Candidates Name:				Staff No.	
Date:		Time:		Location:	
Performance Criteria:					
• • • • •					
Final Results: (Circle As Applicable)		Competent	J	Not Yet Competent	M
Assessor's Name:				Date:	
Assessor's Signature:				Date:	

MAINTENANCE TRAINEE SURVEY

Company			
First Name		Date of Birth	
Family Name		Town of Birth	
Identification*		Country of Birth	

*Company ID, Identity Card, and Passport Number as applicable

License Information (If applicable)				
License	Number	Issue Date	Authority	Aircraft

Recent Experience on Aircraft more than 5.7 Tons			
Aircraft	From	To	Specialty

Level of English				
Reading	Fluent	Good	Poor	With Difficulty
Speaking	Fluent	Good	Poor	With Difficulty

Declaration by Company Authorized Person that above statements are true			
Name	Position	Signature	Date

Mongolian Airlines Use Only				
Acceptable		Name	Signature	Date
Yes	No			
Comments:				

Note: The above information is confidential and cannot be disclosed without written consent of all concerned.

TESTING PAPER

Course title:		Test No:	
Student name:		Date:	
Student signature:			

No	A	B	C	No	A	B	C
1				21			
2				22			
3				23			
4				24			
5				25			
6				26			
7				27			
8				28			
9				29			
10				30			
11				31			
12				32			
13				33			
14				34			
15				35			
16				36			
17				37			
18				38			
19				39			
20				40			
Grade:				Pass Status:			

Examiner's name	Signature

TRAINING ASSESSMENT CHECKLIST

Item:					
Candidates Name:				Staff No.	
Date:		Time:		Location:	

Performance Criteria:

-
-
-
-
-

Area: 1	J	M	Remarks
1. ☐	☐		_____
2. ☐	☐		_____
3. ☐	☐		_____
4. ☐	☐		_____
5. ☐	☐		_____
6. ☐	☐		_____
7. ☐	☐		_____

Area: 2	J	M	Remarks
1. ☐	☐		_____
2. ☐	☐		_____
3. ☐	☐		_____
4. ☐	☐		_____
5. ☐	☐		_____
6. ☐	☐		_____

Area: 3	J	M	Remarks
1. ☐	☐		_____
2. ☐	☐		_____
3. ☐	☐		_____
4. ☐	☐		_____
5. ☐	☐		_____
6. ☐	☐		_____

Area: 4	J	M	Remarks
1. ☐	☐		_____
2. ☐	☐		_____
3. ☐	☐		_____
4. ☐	☐		_____
5. ☐	☐		_____
6. ☐	☐		_____

Comments on Area Requiring Attention:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Final Results: (Circle As Applicable)		Competent	J	Not Yet Competent	M
Candidate's Name:				Date:	
Assessor's Signature:				Date:	

Feedback Questions
Q1 Were you comfortable with the method of assessment?
Q2 Did you have enough time to familiarize yourself with the assessment requirements?
Q3 Was the assessment checklist clear and easy to understand?

TRAINING EVALUATION FEEDBACK

Course:		Date:	

This evaluation feedback form is designed to obtain your feelings and reactions to various aspects of the training. Please be as honest as you can since your comments are anonymous. Your feedback will allow us to continually develop a more effective training programme.
Please circle the most appropriate response and comment where you feel it appropriate.
Key

1. Strongly Agree
2. Agree
3. No Opinion
4. Disagree
5. Strongly Disagree

1. In my opinion the learning outcomes stated at the beginning of the presentation were achieved.
1 2 3 4 5
Comments:_____
_____
_____

2. The topic of the training held by interest from the start.
1 2 3 4 5
Comments:_____
_____
_____

3. The sequence in which the topic was presented flowed logically.
1 2 3 4 5
Comments:_____
_____
_____

4. The main points presented in the training were clear.
1 2 3 4 5
Comments:_____
_____
_____

5. The presenter gave me enough opportunities to ask questions and get involved in the training.
1 2 3 4 5
Comments:_____
_____
_____

6. The presenter motivated me to learn.
1 2 3 4 5
Comments:_____
_____
_____

7. The training was well paced and easy to understand.
1 2 3 4 5
Comments:_____
_____
_____

8. The Training materials were well suited and sufficient to cover the topic.
1 2 3 4 5
Comments:_____
_____
_____

9. The assessment questions were clear and easily.
1 2 3 4 5
Comments:_____
_____
_____

10. The information in the training was sufficient to answer the assessment questions.
1 2 3 4 5
Comments:_____
_____
_____

11. The assessment format is suited to the topic.
1 2 3 4 5
Comments:_____
_____
_____

TRAINING FEEDBACK SUMMARY

Course:		Date Held:	

Summary of Feedback from Participants (Instructor to complete)

-
-
-
-
-
-

Conclusions (Instructor to complete)

-

Name:		Signature:		Date:	

Recommendations (Training Co-ordinator to complete)

-

Name:		Signature:		Date:	

Implementation (Instructor to complete)

-

A signature below certifies: 1. All required amendments carried out (Refer TRM Course Revision process)
2. Course File and Course File Register updated.

Name:		Signature:		Date:	

TRAINING READ AND ACKNOWLEDGE FORM

To:	*<<Candidate Name>>*
From:	
Date:	
Subject:	*<<Insert Manual Title>>*

Please find attached a copy of the Air Accident Investigation Bureau *<<Insert Manual Title>>*

This Training manual is *<<insert brief description of Manual>>*

Approval to carry out these duties is only given once the training manual has been read and understood.

The attached read and acknowledge slip must be signed and returned to the Air Accident Investigation Bureau of Mongolia prior to approval being authorized.

Please sign below as your acknowledgement of receipt of the training manual and that you have read and understood the contents of the manual.

Regards

TO:
I, … … … … … … … … … … … acknowledge that I have received my copy of the AAIB *<<Insert Manual Title>>* and have read and understood its contents.

_____ _____

Signature Date

SRD Building-203
Buyant-Ukhaa
Ulaanbaatar 17120
Mongolia

Tel:+976-11-95953399
Fax: +976-11-70049974
E-mail: aaib@aaib.gov.mn
Web: www.aaib.gov.mn

SYLLABUS

Basic accident investigation course

Module -l- One Week

Introduction

- History of aircraft accident investigation
- Development of the international agreements on the conduct of investigations and the standards and recommended practices adopted by ICAO Contracting States in the field of aircraft accident investigation.
- A review of ICAO Annex13-Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation; ICAO Manual of Aircraft Accident Investigation (Doc 6920) and Manual of
- Aircraft Accident an Incident Investigation (Doc 9756)
  General guidance on the investigation of accidents in which unlawful interference, has occurred and those which involve both civil and military aircraft or facilities.

Accident Notification Procedures

- Accident notification systems and the appropriate responses expected from each State and organization that is notified.
- Way in which the notification of the occurrence of an accident initiates the process of an investigation.Provision of support for the accident investigation authority in the State of Occurrence from 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 by virtue of their proximity to an accident site and providing a permanent base for the investigation.
- Requirements of Annex 13 in relation to this phase of an investigation.

Investigation Management

- Investigator's role, the skills he will need to acquire and the accident investigation process.
- Value of assessing the availability of resources, such as funding, personnel, equipment and buildings, as well as planning for a major accident beforehand.
- An appreciation of the realities of the limits imposed by the resources available and making the optimum use of those resources.
- Guidelines for determining the appropriate size and scope of an investigation,
- The differences between the management of large and small investigations
- Type of circumstances in which assistance from specialists will be beneficial to the success of the investigation.
- The value of memoranda of understanding with departments and organizations that might be involved in an investigation
- Progress meetings.

Investigators' Equipment

- The equipment to be used during investigations and factors determining the use of particular equipment.
- Use of aids such as global positioning systems, satellite telephones, and data links back to base and the basic items such as compasses and inclinometers.
- Means of recording in extreme wet or cold conditions
- Instruction on the proper method of taking samples of aircraft fluids and the appropriate containers

Accident Site Safety

- Safety of personnel at an aircraft accident
- The need to take appropriate measures for protection on the site against exposure to the elements, any hazardous cargo or dangerous materials released from the aircraft, injury or infection
- Medical risks and hazards from the aircraft wreckage and needs of inoculations against such risks as hepatitis, malaria and tetanus
- Demonstration of Protective equipment against airborne and blood borne pathogens
- Utilities such as gas mains, electricity transmission lines and main transport routes.
- A plan for aid and rescue in the event of an accident involving personnel at the site

Module-2-One Week

Protection of Evidence

- Measures to protect the wreckage from fires, meteorological hazards and souveniring. Recording of transient evidence,
- Secure of light objects and recording ground scars and other site markings that may become obliterated
- Determining from the rescue personnel the nature of damage and movement which they may have caused

Initial Action at the Accident Site

- Considerations to be taken into account at the accident site.
- Methods of apportioning time effectively, prioritizing the information to be gathered, plotting of the position of surface marks, identifying and plotting the position of items of wreckage
- The preparation for removal of any exhibits to a secure site.

Information Gathering Techniques

- Methods of gathering and reviewing relevant documentation and procedures,
- Interview techniques used for different types of witnesses
- The transcription of air traffic services and other recordings, the review of aerodrome facilities, emergency services responses
- Meteorological data

Communication and Recording Media

- The various media available for communicating to and from an accident site and recording the evidence at the accident site.
- Recording the information available as accurately and rapidly as practicable using digital video cameras and cameras, standard film photography.
- Use of laptop and hand held computers with connections via satellite telephones to sources of information of immediate use at the site.

Witness interviews

- Preparation for interviews, information to be gleaned from body language, the relative positioning of the interviewer and interviewee.
- Preparation of the questions to be asked; use of open questions.
- Art of listening and general conduct of the interview
- Use of recorders such as video cameras and tape recorders
- Value of written statements and signed transcripts
- The precautions to be taken when interviewing the injured or persons in ill health, the young, the aged, hostile witnesses and Use of experts in the field of inquiry

Recorders

- Different form of recorders which may be useful to the investigation viz. flight recorders, security cameras on the aerodrome perimeter fence, maintenance recorders in the aircraft etc.
- The value of each form of recorder, the methods of interpretation and downloading the information, and the sources of readout.
- Value of manufacturer's expertise in recovering information from damaged recorders such as global positioning receivers, solid-state flight recorders and inertial navigation unit components
- Means of locating the flight recorders and recovering them from locations that are difficult to reach.
- Air traffic control recorders, particularly those that record radar returns

Module-3-One Week

Examination of Relevant Maintenance Documents

- Determining the maintenance history of the aircraft.
- Importance of establishing whether the maintenance, inspection procedures and servicing that is recorded as having been completed has in fact been carried out
- Determining the adequacy of the maintenance procedures specified
- Examination of evidence available to distinguish an in-flight fire or explosion from post-accident fires.
- Means to determine the ignition source and the fuel supply of a fire.
- Examination of effectiveness of firefighting measures available on board the aircraft.

- Means of preventing post-accident fires during an investigation.

Survivability

- Assessment of the occupants' chances of surviving an accident and the means of doing so.
- Formulae for impact force calculations and the various forms of attenuating impact forces
- The limits of human tolerance to heat and impact forces
- Effects of toxic byproducts of the accident environment.
- The efficiency of the rescue and firefighting services, standard pre-flight passenger briefing spiels, restraint systems, seat anchorages and aids to egress from the aircraft
- The review of the factors that affect the occupants' chance of surviving the accident
- The means of determining the after effects of a fire on the occupants and the fire's impediment to passenger evacuation and availability of such items as smoke hoods and smoke goggles.
- Methods used for protecting the aircraft occupants from the impact forces and post-impact effects such as thermal stress and water immersion

Aircraft Structures

- Metallurgy,
- An introduction to fiber reinforced plastics and timber structures; Stress analysis and the strength of these materials; various modes of failure and the symptoms of such failures for these materials.
- Methods of failure analysis
- Reconstruction of areas of interest in the airframe, and the evidence of
- The various types of flight controls and landing gear structures.
- Advanced equipment for the study of failure mechanisms; Preparation of samples for examination by such equipment and the methods for comparative testing of similar materials.
- Means of wreckage trajectory analysis.
- Examples of the various failure modes in materials used in aircraft construction during

Systems

- Aircraft systems including Fly-by wire system, Hydraulic, Pneumatic, Electrical, Pressurization, Flight control, Instruments, Navigation, Autopilot and Instrument systems
- 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.
- Examination of past maintenance records and on-board recorders.
- Software failures in airborne computers and the Adequacy of the protection against catastrophic events ensuing from such failures

Module-4- One Week

Aerodynamics

- Performance

- In-flight structural failure caused by overload, flutter, divergence, aileron reversal and other aero elastic phenomenon
- A review of basic aerodynamics and the means of detecting failure from aerodynamic factors
- Over-speed, engine-out performance, icing and stability.

Power plants

- Basic principles of reciprocating and turbine engines
- The analysis of damage to propellers and helicopter rotors
- General overview of methods of evaluating damage to determine if further investigation of the particular propeller or engine is warranted.
- Examination of propellers and turbine for indication of an absence of engine power at the time of impact.
- Examples of failures and accident damage

Rotary wing aircraft

- A general introduction to the principles of flight for helicopters and their control systems

Module 5 -One Week

Management

- Methods of conducting a review of the management and supervisory aspects of an aircraft operation require such as management's acceptance of inadequate flight crew qualifications, deficient guidance material, maintenance shortcuts, improper crew roistering, failure to provide proper training in aircraft type, crew resource management and unreasonable pressure to complete schedules on time.
- An examination of the means of supervision including a review of orders, regulations, manuals and independent audits, as well as the performance of supervisors, instructors and company management.

Human Factors

- Study of human limitations, communications, fatigue, decision- making processes, flight crew health and the information available from post-mortem examinations
- Examination of the handling of the aircraft such as operations and training; Man-machine relationship and the actions or lack of actions in the events leading to the accident; Study of flight crew members reaction, analysis and attempt to cope with the complexities of the flight; the extent and adequacy of the training relevant to the accident flight.
- A brief review of The ICAO Manual of Civil Aviation Medicine (Doc 8984) and the ICAO Human Factors Training Manual (Doc 9683)

Determination of the flight crew's suitability for the flight

- Familiarity with the flight crew documentation and requirements.

Methods of analyzing the information gathered.

- Procedures for analyzing the evidence and facts determined during the investigation.

Report Writing

- Format for writing reports
- Formulation of appropriate safety recommendations.

News Media and Public Relations

- DGCA policy guidelines
- The ICAO Circular on Guidance on Assistance to Aircraft Accident Victims and their Families (Cir. 285)

Module 6- One Week

- Case studies including midair collisions, In-flight fires, in-flight breakups and weather related accidents.
- Test on Analysis and conclusion of an accident.
- Visit to school of aviation Medicines.
- Visit to National Aeronautical Laboratories.
- Presentation by the Participant.
- Recreate aspects of aircraft's flight path, which are of interest to the investigation.

FORM AIRCRAFT INVESTIGATION FIELD NOTES

AIR ACCIDENT INVESTIGATION BUREAU OF MONGOLIA

File Reference: .....

Accident Investigation Field Notes

This sheet may be used to record site details.

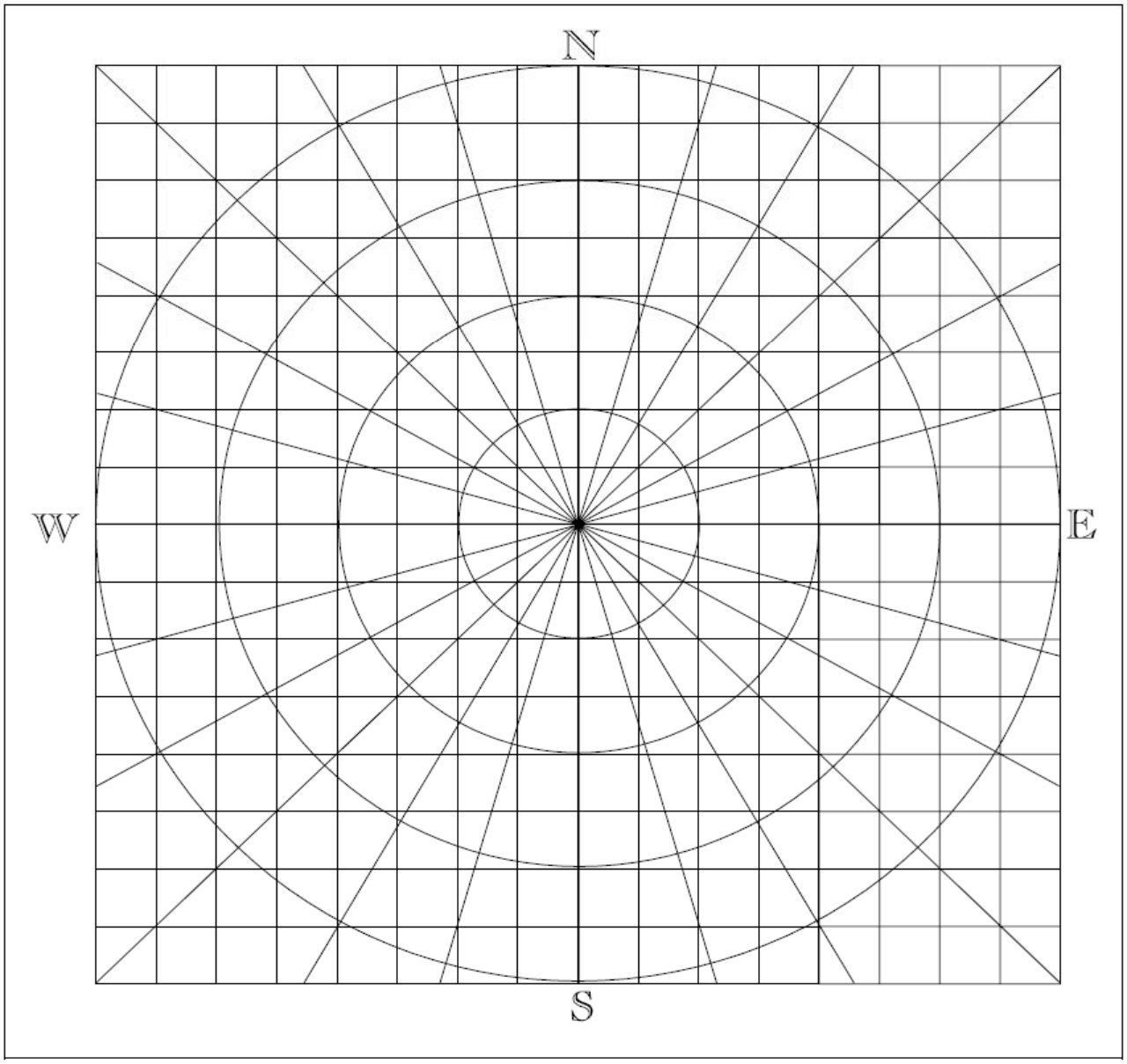
Summary

Aircraft Reg Mark	
Make / Model	
Accident Site	
Accident Date	

Sketch

Description of Sketch					Scale
☐	Wreckage Distribution	☐	Probable Flight Path	Other (describe)	
☐	Witness Location	☐	Runway Data (with wind component)		
Sketch Legend					

Wreckage Distribution Chart

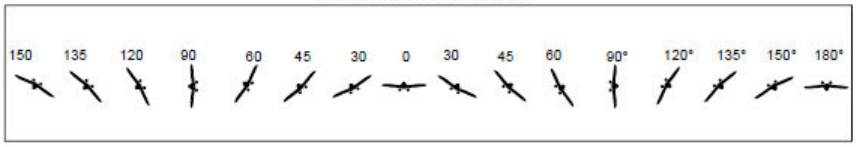


Approximate Attitude on Impact in Relation to Horizon

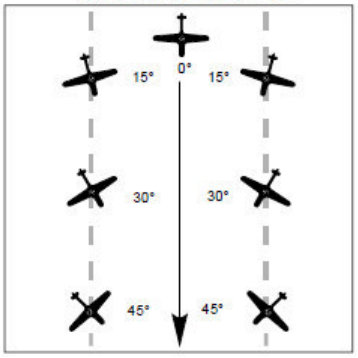
Circle aircraft in three views to indicate approximate attitude at time of impact with objects prior to hitting the ground or at time of first impact with the ground if more than one such impact occurs. Draw squares around aircraft to indicate approximate attitude at time of final impact with the ground.

Relative Wind ( ) Kts

Viewed from Front



Viewed from Above



Viewed from Side

Obstacle(s) Struck before Principal Impact

		Wire		Building	Other (Describe)	Aircraft Component Involved	Speed (Kts)
		Tree		Fence			

Principal Impact

								Other (Describe)	Speed (Kts)
	Soft Ground		Hard Ground		Water		Building		
	Firm Ground		Rocks		Runway/Road		Trees		

Stopping Distance after Principal Impact (ft)

Rolled	Bounced	Slid	Cartwheeled	Dug In	Other (Describe)

Occurrence of Fire

		Nil		In Flight		On Ground	Seconds after Impact	Affected Area (%)

Further Pertinent Details

Overall Condition

Cockpit ⇨	☐ Intact	☐ Distorted	☐ Partly Collapsed	☐ Collapsed	☐ Burnt
Cabin (if any) ⇨	☐ Intact	☐ Distorted	☐ Partly Collapsed	☐ Collapsed	☐ Burnt

Condition of Cockpit Components (L = Left, R = Right, F = Forward, A = Aft)

Component	Intact	Bent	Buckled	Broken	Collapsed	Disintegrated	Burnt	Other (Describe)
Longerons								
Diagonal Braces								
Vertical Members								
Rudder Pedal Area								
Instrument Panel								
Instrument Glass								
Control Wheel Rims								
Control Column								
Collective								
Cyclic								
Roof or Canopy								
Windscreen								
Transparent Side Panels								
Flooring								
Other (Describe)								

Remarks

Examination of Wreckage

Examination of Wreckage				Wreckage Moved Prior to Examination ❑ No ❑ Yes (Provide Details)
	No. Installed	No. Used	No. Failed	Description of Failure
Seat Belts				
Shoulder Harness				

Damage (complete applicable column) I = Impact, F = Fire

Aircraft Component		Destroyed	Substantl. Damage	Minor Damage	None
Propeller	No. 1				
	No. 2				
Engine	No. 1				
	No. 2				
Fuselage					
Flight Control System					
Engine Controls					
Landing Gear					
Horizontal Stabiliser					
Elevators					
Vertical Fin					
Rudder					
Trimtabs	Rudder				
	Elevator				
	Aileron				
Left Wing					
Left Flap					
Left Aileron					
Left Wing Struts					
Right Wing					
Right Flap					
Right Aileron					
Right Wing Struts					
Seats	Front				
	Rear				
Systems	Fuel				
	Oil				
	Electrical				
	Hydraulic				
	Anti-ice				
	Vacuum				
Cabin Heater					
Other (Specify)					
Oxygen	Installed	Used	Any Bearing on Case?		
Pressurisation					

Rotorcraft Component		Destroyed 1	Destroyed 2	Substantl. Damage 1	Substantl. Damage 2	Minor Damage 1	Minor Damage 2	None 1	None 2
Powerplants									
Accessories									
Control Systems									
Lubrication Systems									
Fuel System									
Mounts									
1/		F-L	A-R	F-L	A-R	F-L	A-R	F-L	A-R
Main Rotors									
Blades									
Hubs									
Masts									
Control System									
Transmissions									
Accessories									
Drive(s) System(s)									
Lubrication System									
Airframe									
Cockpit									
Cabin									
Tail Boom/Cone/Pylon									
Landing Gear									
Tail Rotor Guard									
Stabilisers									
Tail Rotor									
Blades									
Hub									
Drive System									
Control System									
Lubrication System									
Systems	Electrical								
	Vacuum								
	Hydraulic								
Seats	Front								
	Rear								
Cabin Heater									
Other (specify)									

If a known failure or malfunction of any component is indicated, submit a detailed description

	Yes	No
Fixed-pitch propeller(s) installed?		
Variable-pitch propeller(s) installed?		

External Load				Trim	
	Litter		Spray	Longitudinal	Fore
	Sling		Tank		Aft
	Hoist		Other (Specify)	Lateral	Right
	Dust Hopper				Left

Blade Angles (if known)		Friction	On Full	Partial	Off
	No. 1	Collective			
	No. 2	Cyclic			
		Fore and Aft			

Overall Condition

Cockpit ⇨	☐ Intact	☐ Distorted	☐ Partly Collapsed	☐ Collapsed	☐ Burnt
Cabin (if any) ⇨	☐ Intact	☐ Distorted	☐ Partly Collapsed	☐ Collapsed	☐ Burnt

Condition of Cockpit Components (L = Left, R = Right, F = Forward, A = Aft)

Component	Intact	Bent	Buckled	Broken	Collapsed	Disintegrated	Burnt	Other (Describe)
Longerons								
Diagonal Braces								
Vertical Members								
Rudder Pedal Area								
Instrument Panel								
Instrument Glass								
Control Wheel Rims								
Control Column								
Collective								
Cyclic								
Roof or Canopy								
Windscreen								
Transparent Side Panels								
Flooring								
Other (Describe)								

Remarks

Aircraft History

Make	Model	Serial No.	Registration Mark
Owner / Operator			

Certificate of Airworthiness

C of A Issuance Date	Type ❑ Normal ❑ Utility ❑ Transport ❑ Commuter ❑ Acrobatic ❑ A G ❑ AM Built ❑ Developmental ❑ Balloon ❑ Airship ❑ Special				
C of A Number	Total Time	Type of Maintenance	Last Inspection		
		❑ Progressive	Type	Date	Acft. Hours at time of inspection
Maint Rel No:		❑ Periodic			
Date Maint. Release Issued:	Current Until	Valid at Time of Accident? ❑ Yes ❑ No	If no, state reason		

Engines

No.	Make and Model	Serial No.	Time			Type of Inspection
			Total	Since Overhaul	Since Last Inspection	
1						
2						

Propellers/Rotors

No.	Make and Model	Serial No.	Time Since New or Overhaul
1			
2			

Equipment Installed

Radio Receivers					Transmitters	
❑ VOR	❑ ILS	❑ ADF/DF	❑ Marker Beacon	Other (identify)	❑ VHF	Other (identify)
❑ VHF	❑ DME	❑ LF/HF	❑ Radar		❑ LF/HF	

Flight Instruments	Elect.	Vacuum	De-icer Equipment		
				None	Type
Compass			❑		
Turn and Bank			❑	Propeller De-icers	
Altimeter			❑	Wing De-icers	
Airspeed Indicator			❑	Empennage De-icers	
Attitude Indicator			❑	Windshield De-icers	
Directional Gyro			❑	Windshield Wipers	
Rate of Climb			❑	Pitot Heater	
Clock			❑	Fuel Tank Vent Heater	
Integrated Flight System				Other Equipment	
Autopilot			❑		
Approach Coupler			❑		
Altitude Control			❑		
Flight Recorder			❑		
Stall Warning Indicator			❑		
Other (identify)			❑		
			❑		

Other Aircraft Involved

Make and Model	Registration Mark -	Name and Address of Owner
Additional Remarks:		

Flight Crew Data

Pilot In Command

(Surname and initials)	Nationality	Licence No. and Type	Medical Category ❑ 1 ❑ 2 Expiry Date:
	Occupation	Date of Birth	Licence Endorsed for this Aircraft? ❑ Yes ❑ No

Instrument Rating	❑ Aeroplane	❑ Command	❑ Multi	❑ None		
	❑ Rotorcraft	❑ Co-pilot	❑ SE	❑ Unknown		
Instructor Rating	❑ Grade 1	❑ Grade 2	❑ Grade 3		❑ None	❑ Unknown
Agricultural Rating	❑ Class 1	❑ Class 2			❑ None	❑ Unknown

Pilot Experience (Hours)	Total	Last 2 Years	Last 90 Days	Special Experience (Enter total hours or unknown against any significant items)			
Fixed Wing				Agricultural		Instrument	
Rotary Wing				Instruction		Night Flying	
This type of aircraft				Gliding		Simulator	
Last Proficiency Check	Licence Restrictions (specify)			Testing		Command	
Date				Demonstration		Acrobatic	
Type							
❑ Unknown				Was pilot wearing corrective spectacles at time of accident? ❑ Yes ❑ No			
❑ Not relevant							

Control Seat Occupied	❑ Front	❑ Rear	❑ Left	❑ Right		❑ Unknown
Dual Controls Available	❑ Elevator	❑ Aileron	❑ Rudder	❑ Throttle	❑ Steering	❑ Brakes

Other Pilot

(Surname and initials)	Nationality	Licence No. and Type	Medical Category ❑ 1 ❑ 2 Expiry Date:
	Occupation	Date of Birth	Licence Endorsed for this Aircraft? ❑ Yes ❑ No

Instrument Rating	❑ Aeroplane	❑ Command	❑ Multi	❑ None		
	❑ Rotorcraft	❑ Co-pilot	❑ SE	❑ Unknown		
Instructor Rating	❑ Grade 1	❑ Grade 2	❑ Grade 3		❑ None	❑ Unknown
Agricultural Rating	❑ Class 1	❑ Class 2			❑ None	❑ Unknown

Pilot Experience (Hours)	Total	Last 2 Years	Last 90 Days	Special Experience (Enter total hours or unknown against any significant items)			
Fixed Wing				Agricultural		Instrument	
Rotary Wing				Instruction		Night Flying	
This type of aircraft				Gliding		Simulator	
Last Proficiency Check	Licence Restrictions (specify)			Testing		Command	
Date				Demonstration		Acrobatic	
Type							
❑ Unknown				Was pilot wearing corrective spectacles at time of accident? ❑ Yes ❑ No			
❑ Not relevant							

Control Seat Occupied	❑ Front	❑ Rear	❑ Left	❑ Right		❑ Unknown
Dual Controls Available	❑ Elevator	❑ Aileron	❑ Rudder	❑ Throttle	❑ Steering	❑ Brakes

Flight Data

Flight Plan

❑ None	Lodged at	Time (Hours) NGT VMC		
From	To	Via	❑ IFR ❑	❑ VFR
EET (Mins)	Endurance (Mins)	Cons. Rate	Height (ft)	❑ NOSAR
SARTIME (Hrs)	To	Facility		
Com. Frequencies		Radio-Nav.		
Emergency Equipment (Describe)				

Meteorological Data

Meteorological Briefing (Attach copy of forecast if relevant)

❑ None ❑ By Facsimile ❑ By Telephone	❑ Route Forecast ❑ Terminal Forecast ❑ Area Forecast	Other (Describe)	Source of Met. Information

Meteorological Conditions at Accident Site

Cloud Type/Amount	Cloud Base amsl ft	Visibility ❑ Day ❑ Night Miles ❑ Dawn ❑ Dusk	Wind Speed and Direction	Temperature °C

Load Data

Aircraft Weight (Lbs)		
Limits ⇨	Take Off	Landing
	Weight (Kg)	How Established
Aircraft basic weight (includes empty weight, oil and removable equipment)		
Flight Crew (No.....)		
Passengers (No.....)		
Baggage (Pieces.....)		
Freight (Pieces.....) or hopper contents		
Fuel (.....Ltrs/Kg)		
Weight at last take off		
Fuel/Load Deductions		
Weight at Accident		

Aircraft Centre of Gravity		
Datum		
Limits ⇨	Forward / Aft	
Position at last take off		❑ Unknown
Position at Accident		❑ Unknown
Agricultural Hopper Load		
Contents (Describe)		
Load at Impact (Kg)	❑ Weighed ❑ Estimated ❑ Reported	
Discharge Valve Position		
Dump Effected? ❑ Yes ❑ No	If yes, amount (%)	

Loading Control

(Describe briefly any unsatisfactory features of loading control such as miscalculations, inadequate load security, improperly consigned dangerous goods etc.)

Hrs ☐ Mins ☐