

**NIGERIAN SAFETY INVESTIGATION BUREAU**



# **INVESTIGATION TRAINING MANUAL**

---

**13<sup>th</sup> December 2022**



## CHAPTER 1 MANUAL ADMINISTRATION

### 1.1 PREAMBLE

1.1.1 This Training Program Manual is an internal document of the Nigerian Safety Investigation Bureau (Bureau) (hereinafter called "the Bureau"). It contains the training policy, program, plans, processes and recording of trainings relating to the technical personnel of the Bureau for the purpose of acquiring and maintaining competence and qualification in the conduct of their assigned duties of Air Safety Investigations.

1.1.2 The objective of the training program is to train air safety investigators to acquire knowledge; skills and experience to enable them independently conduct major aircraft accident investigation. It is understood that systematic training and exercises are key factors for enhancing the Bureau's performance.

1.1.3 The training program is systematic and structured to provide oversight and management of air safety investigators' career development from new hire status the time they are newly hired into the Bureau, through the attainment of Investigator-In-Charge, and throughout their careers to retirement. It is also designed to prepare new hires for their new role as air safety investigators and to ensure that individual investigator training is documented and retained.

1.1.4 This document provides means of establishing the training requirements for all investigators. These requirements include both formal classroom training courses, and on-the-job training, including simulation of aircraft crash exercises and attachment to foreign Accident Investigation Authorities (AIA).

1.1.5 This training program manual also provides the procedures required to identify training needs, select training methods, accomplish the training; record the training and measure the effectiveness of the training program. It also describes how to identify job functions, required tasks and skills.

1.1.6 This training program establishes the criteria for initial and recurrent training, monitoring the training courses and curricula. It can be a tool to be used by the management of Bureau to enhance employee capabilities and competency.

1.1.7 This training program manual in principle adopts the guidance provided by ICAO Circular 298. The Circular discusses the experience and employment background required for the training as an air safety investigator. It also outlines the progressive training that is considered necessary to qualify a person for the various investigation roles, including appointment as the Investigator-in-charge (IIC) of an investigation into a major accident involving a large transport category aircraft.

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1.1.8 This manual supplements the Bureau's Investigation Policy and Procedures Manual (iPPM).

1.1.9 Except for material which has been approved for public distribution, the contents of this Manual are not intended to be communicated to persons outside the Bureau without the consent of the Director-General/CEO.

1.1.10 This manual will be revised as necessary based on periodic reviews to ensure that it contains up to date materials consistent with Nigerian laws, Regulations, Directives, international best practices, evolution of new technology and changes in the aviation industry. Therefore, comments and recommendations for revisions/amendments to this publication for its improvement are hereby welcomed.

1.1.11 The Director-General/CEO of the Bureau is accountable for approving the contents of this manual and any subsequent amendments thereto and shall provide the resources to ensure that all personnel engaged in accident and serious incident investigations are trained using the latest amendment of this Manual.

1.1.12 This training program is non-binding in nature and should be treated as a recommended training path for the Bureau's air safety investigators.

1.1.13 Throughout this manual, with the exception of the definitions in Chapter 1, the use of the male gender should be understood to include male and female persons and the term "accident" should be understood to include "incident".

1.1.14 I hereby approve this Investigation Training Manual for use in acquisition of requisite knowledge, development of necessary skills and improvement of employee attitudes at work.

**Engr. Akin Olateru M.SC., CMILT, FRAeS**  
**Director-General/CEO**

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## 1.4 RECORD OF AMMENDMENTS

Issue No.	Revision No.	Date of Revision	Affected Pages	Reasons for the Change	Entered by
01	0	26/07/2018	All	New Issue	Abdullahi Babanya
01	01	04/01/2022	All	1) Inserted paragraph numbering all through the manual; 2) Redesigned and updated the Record of Amendments Table; 3) Added Safety (SSP/SMS) Training Program; 4) Revised intervals of some of the recurrent training courses.	Abdullahi Babanya
01	02	13/12/2022	All	Changed areas affected by transition from AIB to Bureau	Abdullahi Babanya

## 1.5 DEFINITION OF TERMS

The definition of the terminology is hereby given to ensure that the readers understand the intended meaning of the term used in the context of this manual.





**Accident Investigation Authority** the State organization responsible for conducting aircraft accident investigations within the context of Annex 13

**Accident investigator** A person engaged in the investigation of aircraft accidents, incidents and other aviation safety hazards (interchangeably used as air safety investigator)

**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

**Air Safety Officer**

- 1) A person who has been hired as an investigator by the Bureau, but who does not meet all of the minimum recruitment standards specified by the Bureau. The individuals in this category will continue to develop their training and experience under the guidance of the Bureau until meeting the minimum requirements for new investigators.

- 2) A new-hire investigator who meets all of the recruitment standards but who has not yet completed the core training requirements for an Investigator

**Body of Knowledge** Overall understanding and competency of a subject or competency to perform a task, established through training, education and/or experience

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<b>Certificate</b>	A document issued as evidence of completion of a course of study, or to certify that a person may officially practice a job function
<b>Classroom Training</b>	Teaching in the form of instruction in a course environment also referred to as Formal Training
<b>Competence</b>	Demonstrated ability to perform the skills or accomplish the task associated with a job assignment
<b>Demonstrate</b>	To establish or show by experiments, examples, practical application, explanations, illustrations or other methods as applicable
<b>Education</b>	Knowledge or skill obtained by a learning process
<b>Experience</b>	Competency gained through participation in activities leading to the accumulation of knowledge, skill, or practical wisdom
<b>Expert/Specialist</b>	A person invited to participate in an investigation, on the basis of his or her specialized knowledge, skills or experience.
<b>Formal Training Course</b>	A course of training conducted in a classroom environment in accordance with an Approved Curriculum and most courses conducted by approved training institutions
<b>In-House Training</b>	Training conducted by the Bureau including OJT, Case studies, classroom training, mentoring, self-study,

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specialized training tutoring or other methods considered by the Bureau

**Initial Training**

Learning the subject matter for the first time

**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

**Job**

A single position with documented attributes

**Job Function**

A classification that consists a group of jobs with related assignments, but with varying levels of expertise

**Job Task Analysis**

A document that provides a description of the task, required supporting documents, and a step-by-step listing of the subtasks that must be performed to accomplish the task

**On-the-job-Training**

Acquiring knowledge and skills in an actual work environment by authorized instructor or experienced investigator

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<b>Qualification</b>	The body of knowledge associated with accomplishing the assigned job
<b>Recurrent Training</b>	Reinforce or refresh previously learned subjects, principles or skills
<b>Self-Study</b>	Material absorbed on one's own through workbook, tape, or Compact Disc (CD) and examinations or demonstration that the knowledge gained
<b>Seminar</b>	Training by an expert in the field transferring knowledge to the attendees
<b>Skill</b>	Technique required to accomplish a task
<b>Tasks</b>	Series of steps used in an assigned duty. The actual steps conducted to achieve a result
<b>Training</b>	Processes of impacting knowledge, skills and attitude for making employees proficient in assigned duties using instruction and/or practice
<b>Tutoring</b>	One-on-one instruction in an organized manner



## 1.6 ABBREVIATIONS AND ACRONYMS

ACCREP	Accredited Representative
AIA	Accident Investigation Authority
AIB	Accident Investigation Bureau
ATC	Air Traffic Control
CEO	Chief Executive Officer
CVR	Cockpit Voice Recorder
ICAO	International Civil Aviation
IDP	Individual Development Plan
IIC	Investigator-In-Charge
ISASI	International Society of Air Safety Investigators
NCAA	Nigerian Civil Aviation Authority
NSIB	Nigerian Safety Investigation Bureau
OJT	On-the-Job-Training
SAA	Singapore Aviation Academy
SARPs	Standards and Recommended Practices
SCSI	Southern California Safety Institute
SSP	State Safety Programme
UK AAIB	United Kingdom Air Accident Investigation Branch

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USC

University of Southern California

US NTSB

United States National Transportation Safety Board



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## 1.7 MANUAL AMENDMENT PROCEDURES

1.7.1 The management of the Bureau recognizes that aviation is a high-tech industry that is continuously evolving with new innovations. It is acknowledged that this training manual and the guidelines contained therein are also evolutionary in nature and will need to be updated periodically. This is to ensure compliance with the National, International and Industry requirements all the time.

1.7.2 Thus, this manual will be revised as necessary to ensure that it contains up-to-date materials consistent with Nigerian laws, Regulations, Directives, international best practices, evolution of new technology and changes in the aviation industry. However, in the absence of any change to the guiding documents, the manual will be reviewed periodically at an interval of once every three (3) years.

1.7.3 The initial issue of this manual shall have issue number 01 and the revision number 0 annotated on the footer of each page. Any subsequent amendment to the manual or portion of it shall be accompanied with new List of Effective Pages (LEP) showing the new revision number and date of the revision against the affected pages, the Record of Revision page is also amended to indicate the new revision number and date inserted. All the affected pages of the manual shall have the new revision number and date annotated on the footer. If more than 45% of the contents of the manual is revised, the amendment shall be given the next consecutive ISSUE number and the revision number shall restart afresh from revision number 0.

1.7.5 Individual or group who have received the training may submit comments and suggestions for improvement. It is believed that such comments and suggestions could be helpful to the overall improvement of the standards of this Manual.

1.7.6 All comments/suggestions can be made in Manual Change Request Form NSIB.01.20 (Refer to Appendix I). The completed Form should be forwarded by hand or email to the Training Coordinator through [info@aib.gov.ng](mailto:info@aib.gov.ng).

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1.7.7 The training Coordinator is responsible for incorporating changes to this manual, including formulation of the texts of amendment to the manual. The Director-General/CEO or any officer duly designated is responsible for approving any change to this manual.

1.7.8 This Manual is a controlled document of the Bureau to be used by relevant personnel, including those assigned instructional duties as a guidance material. The Director-General/CEO has the Master Copy of this manual.

1.7.9 The TC shall ensure that a digital copy of the manual is uploaded unto the Bureau's website for access by all staff. Any copy printed or downloaded from the website shall be deemed to be valid only for that period and shall not be used to perform task except for training purposes-

1.7.10 Enquiries about the most up-to-date version of the iPPM shall be forwarded to the Director-General through [info@aib.gov.ng](mailto:info@aib.gov.ng). and [Commissioner@aib.gov.ng](mailto:Commissioner@aib.gov.ng).

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## CHAPTER 2 GENERAL INFORMATION

### 2.1 INTERNATIONAL OBLIGATIONS

2.1.1 Nigeria as a signatory to the Convention on International Civil Aviation (known as the *Chicago Convention*), is obligated to implement the Aircraft Accident and Incident Investigation requirements of ICAO which are contained in relevant Articles of the Convention and in the Standards and Recommended Practices (SARPS) in Annex 13 to the Convention. In addition to these, ICAO publishes many documents which contain *best practices* which serve as guidance for the operation of the Bureau.

2.1.2 In order to fulfill its ICAO obligations, the Federal Government of Nigeria created the Nigerian Safety Investigation Bureau (NSIB) amongst other agencies. The Bureau in particular, is then granted the responsibility and authority to implement the ICAO aircraft accident and incident investigation requirements on behalf of the Federal Government of Nigeria.

2.1.3 The work of Bureau is accomplished by a group of highly skilled aviation professionals. Among these are the air safety investigators who accomplish many of the daily technical functions of the Bureau as required by ICAO. In this regard, the Investigators represent the Federal Government of Nigeria and their role is critical to both local and international aviation safety.

2.1.4 Air safety investigators are selected based on relevant extensive academic qualifications or from the aviation industry and considering their aviation experience, technical expertise, superior judgment, and high ethical standards.

2.1.5 In order to fulfill their responsibilities, air safety investigators require the continuous development of their knowledge and skills. After they are selected, they must complete a comprehensive training program provided by the Bureau. This training ensures that the Investigators are fully qualified to accomplish the duties of the Bureau and the Aircraft

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Accident Investigation responsibilities of the Federal Government of Nigeria as required by the Chicago Convention.

## 2.2 TRAINING POLICY

This policy has been developed by Nigerian Safety Investigation Bureau (NSIB) for the proper implementation of training of its staff to maintain their competency.

This policy contains guidance to prepare training programme and training plan for NSIB personnel. Furthermore, this policy also contains the guidance to maintain records of all trainings received by NSIB personnel.

The Bureau has adopted the guidance contained in ICAO Circular 298 - Training Guidelines for Aircraft Accident Investigators, as a basis for its selection and training program. That guidance addresses background and experience of new investigators, as well as initial and recurrent training of investigators. A summary of that guidance has been incorporated into this manual to provide a policies and procedures for the Bureau's investigator selection and training program.

This policy will come into force after its approval by the Director General. This policy will be reviewed to maintain the currency and consistency as per ICAO Circular 298.

This policy seeks to ensure that sufficiently trained and qualified personnel are within the NSIB to perform all its task and activities including aviation safety.

The Bureau air safety investigators must complete the training requirements specified in this manual.

### COMMITMENT

It is the policy of Nigeria Safety Investigation Bureau to:

- a) Establish and implement training Programme for each technical staff position with investigation duties to be completed within three (3) years.

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- b) Provide sufficient financial resources are provided for staff training and development in accordance with this training policy/Program.
- c) Develop and implement an annual training plan for each technical staff member and other staff of the Bureau.
- d) Carry out training needs assessment annually.
- e) Conduct training evaluation.
- f) The Director General shall enhance the implementation of the training program and plans.
- g) Prioritize technical trainings for personnel of the Bureau and is committed in investing in the training of its employees and to an extent that has the prospect of resulting in improved performance of employee in the conduct of their aircraft accident investigation duties and thus, enhance the Bureau's capabilities and performance in improving Aviation Safety.
- h) Provide all employees access to training and developmental opportunities in an equitable manner consistent with the availability of resources.
- i) Provide recurrent training to its investigators, at least, every two years.
- j) Actively encourage self-education, self-training, and self-improvement of its employees.
- k) Ensure that skills, knowledge, and abilities obtained from training assist in achieving the goals of the Bureau by improving employee and organizational performance.
- l) Emphasize that government-supported training should be used to supplement, not replace, efforts made by employees to achieve their career objectives.
- m) Use existing methods and develop additional methods to meet training needs, including contract courses, seminars, workshops, meetings, conferences, and training details.

## **TYPES OF TRAINING**

The Management of the Bureau shall implement the training program and plans based on order of priorities as listed:

- Phase I: Initial training
- Phase II: On-the-job training.
- Phase III: Basic accident investigation training
- Phase IV: Advanced accident investigation training
- Phase V: Specialty and additional accident investigation training
- Phase VI: Recurrent accident investigation training and Remedial training
- Phase VII: Management/Leadership training.

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Initial, OJT, Basic, Advanced, specialty and Recurrent accident investigation trainings are mandatory type of courses that are captured in the training Programme, while the Management/Leadership training are optional and at the discretion of the management.

A handwritten signature in red ink, appearing to be 'A. Olateru', is positioned above the printed name.

**Engr. Akin Olateru**  
**Director-General/CEO**



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## 2.3 ROLES AND RESPONSIBILITIES

The Director-General /CEO and certain designated staff members of the Bureau have overall responsibility for the successful implementation of this training program. These responsibilities include managing, coordinating, and developing training policies, procedures, plans, and budgets for all aspects of the training program. Roles and responsibilities are included in this section for the following positions:

- 1) Director-General /CEO
- 2) Directors/ Heads of Departments or units
- 3) Training Coordinator
- 4) Instructors
- 5) Air Safety Investigators (ASIs)/ Trainees

The Director-General /CEO are responsible for the following:

- a) Staffing:
  - i. Hire highly qualified individuals to serve as air safety investigators
  - ii. Provide attractive remuneration
  - iii. Provide qualified and sufficient staff to ensure fulfillment of Bureau objectives
  - iv. Assign office resources: provide qualified people and sufficient time to support investigator training
  - v. Appoint Training Coordinator to oversee implementation of the investigator training program
- b) Budget:
  - i. Ensure adequate funds required to fully support the requirements of this training program is included in the Bureau's budget as appropriate
  - ii. Ensure adequate resources are provided in timely manner to fully implement this training program

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- c) Approve and release of funds on timely manner to execute the trainings identified in this manual

Training:

- i. Provide leadership and direction to support the implementation of the training program
- ii. Ensure the training program complies with all policy requirements
- iii. Ensure the development of a highly skilled and qualified work force
- iv. Ensure the training program is reviewed periodically to meet national, international and industry standards
- v. Ensure the training program is effectively and efficiently managed
- vi. Ensure heads of departments/units are accountable for ensuring that employee work schedule allow for sufficient time to allow staff to fully attend and complete the training requirements

### 2.3.2 Directors/Heads of Departments or Units

The Directors/ heads of departments or units are responsible for the following:

- a) Determine in conjunction with the Training Coordinator, the training needs of each of the employees they supervise through annual performance evaluation process by assessing gaps between mission requirements and actual employee skills using the IDP and Training Needs Assessment Form NSIB.04.06.
- b) Determine knowledge and skills development needs of the workforce they supervise
- c) Advise Training Coordinator on the training gaps identified on each employee they supervise
- d) Ensure employee work schedules allow sufficient time for employees under their supervision to fully participate in and complete training requirements
- e) Foster work environment conducive to the success of the training program

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- f) Support effective and efficient implementation of employee training plans

## 2.3.3 Training Coordinator

2.3.3.1 The Training Coordinator is the overall responsible person for the day-to-day management, including standardization, implementation and revision of the training program. He plays a key role in assessing gaps between mission requirements and actual employee skills, identifying development needs, prioritizing training needs, certifying the accomplishment of learning objectives and fostering on-the-job (OJT) development.

2.3.3.2 The Training Coordinator is also responsible for the following:

- a) Coordinate and communicate with respective Directors/ heads of departments or units to be sure they are aware of the policies and changes to the training program
- b) Recommend policy or procedural changes to the training program
- c) Ensure allocation of resources from the Bureau required to fulfill the investigators' training requirements
- d) Notification to Human Resource department regarding changes in training requirements, specify new training needs not previously identified, and relinquish training resources that no longer apply
- e) Full implementation of the training program
- f) Develop in conjunction with the Directors/ Heads of Departments or units, annual investigators' training plans, including courses that are required for each investigator
- g) Ensure annual training plans are derived from the training program
- h) Ensure timely submission of annual training plans to the CEO for approval and inclusion in budget
- i) Schedule and arrange for implementation of formal training courses that are approved, including logistics associated with training events
- j) Arrange OJT events, including logistics associated with the OJT events

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- k) Negotiate and oversee contracts and agreements with training providers/ institutions
- l) Advise the Director-General /CEO and/or Human Resource department when training has been completed
- m) Ensure all training records are securely kept
- n) In conjunction with the Head of departments conduct annual review of the training records for each investigator to determine on-going training needs
- o) Conduct of periodic review of training courses to ensure that the content remains current and relevant to job tasks, knowledge, skills and employee performance requirements
- p) Evaluate the effectiveness of the training program on a continuous basis and providing feedback to the Director-General / CEO
- q) Manage and administer OJT program, including identification of specific job tasks for which investigators must complete, designating qualified investigators to serve as OJT instructors, ensuring performance of OJT instructors meets acceptable standards

## 2.3.4 Instructors

2.3.4.1 Instructors are designated by the Director-General /CEO based on the recommendations of the Heads of departments. Instructors, including OJT Instructors are specified from amongst the pool of highly experienced and qualified investigators in each of the investigation areas in Operations and Engineering. They are responsible for implementation of the OJT events.

2.3.4.2 The Instructors are responsible for the following:

- a) Schedule in-house formal classroom training and OJT events
- b) Logistics associated with the training events
- c) Conduct the training events

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- d) Certify and sign out the training events
- e) Keep training records for each investigator
- f) Advise the training Coordinator when training program has been completed
- g) Review personal training records and documentation as directed
- h) Provide feedback and evaluation regarding the effectiveness of the training events

## 2.3.5 Air Safety Investigators (ASIs)/ Trainee

2.3.5.1 Bureau depends on the competence, talent and dedication of its air safety investigators (ASIs) to accomplish its stated goals, mission and objectives of aircraft accident investigation. To meet this challenge, ASIs must recognize and take advantage of opportunities, whether on the job, observation or attachment with foreign Accident Investigation Authorities (AIAs), or in formal training, to develop expertise required by changing job requirements. It is understood that as the ASI gains experience, he will realize that the need to increase knowledge and upgrade personal skills to optimize his capabilities is a continuing process which requires full personal commitment to excellence.

2.3.5.2 Therefore, each air safety investigator is responsible for the following:

- a) Collaborate with Training Coordinator to identify his training needs by filling and submitting his/her Training Needs Assessment Form NSIB.04.06
- b) Communicate with OJT Instructors to plan training activities
- c) Actively participate in training activities
- d) Review personal training records and documentation as directed
- e) Provide feedback and evaluation regarding the effectiveness of the training program

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## 2.4 INVESTIGATOR QUALIFICATION REQUIREMENTS

### 2.4.1 Background Experience for Air Safety Investigators

2.4.1.1 In accordance with guidelines provided by ICAO Circular 298, aircraft accident investigation is a specialized task which should only be undertaken by qualified air safety investigators (ASIs). As such the Accident Investigation Authority should train appropriately qualified personnel in the accident investigation techniques required to participate in or to conduct an aircraft accident investigation. When assigned to an accident investigation, such personnel should be relieved of their regular duties for the duration of the investigation when there is a real or perceived interference which could impede the independence or quality of the investigation.

2.4.1.2 Potential air safety 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 might also be suitable for ASI training. 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.

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

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

- a) 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;
- b) a knowledge of aircraft accident investigation techniques;
- c) an understanding of aircraft operations and the relevant technical areas of aviation;
- d) the ability to obtain and manage the relevant technical assistance and resources required to support the investigation;
- e) the ability to collect, document and preserve evidence;
- f) the ability to identify and analyze pertinent evidence in order to determine the causes and, if appropriate, make safety recommendations; and
- g) the ability to write a final report that meets the requirements of the accident investigation authority of the State conducting the investigation.

2.4.1.5 In addition to technical skills and experience, an air safety 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.

2.4.1.6 An air safety investigator is desirous to have investigation management qualification and skills in team management, relations with numerous State authorities and private organizations, international relations, communication and report writing.

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## 2.4.2 Air Safety Investigator Qualifications – New Hire

Air safety investigators (ASIs) conduct highly technical work and occupy sensitive and authoritative positions as representatives of the Bureau and the Federal Government of Nigeria. It is essential that new investigator candidates meet the highest standards of competence and integrity. The minimum requirements for new-hire investigators who are selected as new hires are provided below. While not absolute, these qualifications and experience requirements provide important guidelines for initial employment of new investigators. The minimum requirements for new-hire Investigators who are selected as new hires are provided below. While not absolute, these qualifications and experience requirements provide important guidelines for initial employment of new investigators.

### 2.4.2.1 General Requirements for New Hires (All Air Safety Investigators)

- a) Broad air transport background of three years or more/relevant academic and technical education in related specialties.
- b) Experience with the problems of operating or maintaining transport aircraft.
- c) Meteorological and climatology knowledge and experience.
- d) Experience in technical training including visual aids, training devices and aircraft flight simulators.
- e) Reputation for possessing qualities of integrity, impartiality, perseverance, analytical prowess, initiative, tact, tolerance, good understanding of human nature, ability to get along well with people and patience.

In addition to these general requirements, the Bureau has also provided specific technical requirements for both Operations and Engineering Investigators.

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## 2.4.2.2 Specific Technical Requirements for New Hires

### 1. Engineering Investigators

- ❖ Extensive academic and technical education (a minimum of university degree or equivalent in related engineering specialties e.g., aeronautical, mechanical, electrical, electronic, or telecommunication; or equivalent professional qualifications.
- ❖ For equivalent professional qualifications he should possess aircraft maintenance engineer's licenses with ratings or appropriate approvals, commensurate with his job responsibilities, i.e., License with airframe and power plant or Avionics ratings, flight engineer license, etc.).
- ❖ For graduates, except for aeronautical engineers, they should have attended or been provided with a basic training in aircraft maintenance engineering.
- ❖ Progressed through positions of increased technical and supervisory responsibility in the aviation industry.
- ❖ At least 10 years of technical employment is normally required to obtain the minimum qualifications and experience needed to perform the duties of a basic starting position as an Engineering Investigator.

### 2. Operations Investigators

- ❖ A minimum of secondary education certificate. Applicants with higher education such as a university degree or equivalent will be preferred.
- ❖ Holds or have held a current professional license – ATPL, Flight Engineer, Dispatcher, Cabin Crew, Air Traffic Controller license with appropriate ratings.
- ❖ Must possess a broad air transport background of a minimum of 10 years with not less than 5000 hours as Pilot-In-Command (PIC) in military or civil aircraft or 3500 hours as Flight Engineer.

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- ❖ Previous appointments either in operational management, as an airline pilot or training instructor, or as a military pilot, or a flight engineer or instructor, flight dispatcher or instructor, flight attendant or instructor, or Air Traffic Controller or instructor, where experience in air transport operations would have been acquired will be an advantage.
- ❖ Must possess experience in technical training including visual aids, training devices and aircraft simulators;

### 2.4.2.3 Designation of Instructors

- ❖ The Prospective instructor should be an experience investigator to be nominated by the directors of Engineering or Operations.
- ❖ Ability to demonstrate a task in a clear and logical order
- ❖ Willingness to prepare training, instruct and coach trainees on performance of tasks being trained.
- ❖ Qualified on the job specialty and job tasks they intended to teach and officer should be subject Matter Expert (Experience investigator, SMS, HFs, safety Lab, etc.)
- ❖ The prospective instructor shall attend Instructor Course- (Instructional technique course/Train-the-Trainer)
- ❖ Check out - The First set of trained or qualified instructor should checkout for each other
- ❖ Subsequent prospective instructors should undergo OJT to be provided by an assigned instructor. The OJT should be carried out in minimum of two training sessions.
- ❖ Upon successful completion of the OJT, the training coordinator should recommend to the DG for approval.
- ❖ The Director General/CEO shall issue a designation letter to the qualified instructor specifying the specialties of instructional duty.

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## CHAPTER 3 TRAINING PROGRAM

### 3.1 GENERAL

3.1.1 After selection and hiring of new investigators, the trainee will undergo training. Moreover, serving investigators also require training.

3.1.2 Each newly hired investigator possesses some knowledge and experience applicable to the assigned tasks; however, the level of such knowledge and experience from one investigator to another varies. For example, two highly qualified flight operations investigators could be hired and both possess extensive flight operations background; however, one may only have limited incident investigation experience, while the other may have considerable major accident investigation experience.

3.1.3 The Training Programme is comprised of the following phases:

- a) Phase I: Initial training
- b) Phase II: On-the-job training.
- c) Phase III: Basic accident investigation training
- d) Phase IV: Advanced accident investigation training
- e) Phase V: Specialty and additional accident investigation training
- f) Phase VI: Recurrent accident investigation training and Remedial training
- g) Phase VII: Management/Leadership training

It also includes attendance of workshops, seminars, conferences, aviation industry meetings and attachment with foreign AIAs.

3.1.4 The INITIAL training of a particular subject matter is that training is provided to a trainee for the first time. However, some training courses are one-off types while some require them to be repeatedly delivered to trainees in a periodic manner with specified intervals in order to keep trainees current on the subject matter. For example, Aircraft Type (System) training, Crew Resources Management (CRM) training, Pilot Proficiency training, Human Factors training, State Safety Program (SSP)/ Safety Management Training, Accident Site Hazards and Risk Management/Awareness training, and so on, are some of the training courses that are required to be periodically repeated at specified

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intervals. When each of these trainings are provided to a trainee for the first time, then it becomes an Initial Training to him. All subsequent trainings that follow of the same subject matter are termed RECURRENT trainings. Refer to Section 3.2.9 below for the list of all relevant RECURRENT trainings that an ASI requires.

3.1.5 The INITIAL aspects of the training courses are usually more in-depth and take longer period while the RECURRENT aspects comprise of a recap of the highlights of the INITIAL parts of the training plus a review of new changes, including additions or subtractions occasioned by technological advancement that might have occurred overtime on that subject matter.

Refer to Appendix II for sample of training program



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## 3.2 PHASES OF TRAINING

3.2.0.1 Air safety investigators (ASIs) require different levels of experience, knowledge and training according to the particular role to which they are assigned. ASIs should receive training commensurate with their responsibilities as an air safety investigator, group leader, Investigator-in-charge (IIC), accredited representative (ACCREP), Adviser or Expert/Specialist. The training guidelines and course syllabi should be planned in such a way that the investigators receive appropriate levels of training that will enable them to perform efficiently in any of the roles assigned to them.

3.2.0.2 Training a person for aircraft accident investigation involves several phases. These phases include:

- a) Phase I: Initial training
- b) Phase II: On-the-job training.
- c) Phase III: Basic accident investigation training
- d) Phase IV: Advanced accident investigation training
- e) Phase V: Specialty and additional accident investigation training
- f) Phase VI: Recurrent accident investigation training and Remedial training
- g) Phase VII: Management/Leadership training

3.2.0.3 Formal classroom courses are designed to complement on-the-job training (OJT) 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.

3.2.0.4 These structured courses in aircraft accident investigation are conducted by universities, manufacturers, military establishments, accident investigation authorities and other educational.

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3.2.0.5 Refer to the ICAO *Aviation Training Directory* for the list of recognized institutions that offer aircraft accident investigation courses.

3.2.0.6 The Director-General/CEO may enter into arrangement such as MoU, contract or agreement to facilitate training of Bureau's air safety investigators.

### **3.2.0.7 Indoctrination Training**

3.2.0.7.1 Prior to the implementation of the training Programme all new hire employees must undergo indoctrination training.

3.2.0.7.2 The indoctrination training is designed to provide a new employee with the orientation information and administrative procedures related to such things as time and attendance, leave, pay, retirement, conduct and discipline, etc. it serves as induction course and provides initial guidance to new employees in to the Bureau.

3.2.0.7.3 Indoctrination training is provided to the new hire employee just as he completes initial documentations before he assumes work. It is recommended that this training is provided within the first month of assumption to duty.

3.2.0.7.4 It is better conducted for a batch comprising of new employees from various departments or units of Bureau to create synergy amongst them and better understanding of the inter-relationships between various departments or functional units of Bureau.

3.2.0.7.5 This is an In-House training that is organized by the Human Resource department. All Directors, Heads of departments or units serve as resource persons for this training.

3.2.0.7.6 The training has duration of 40 hours (5 days). It applies to new hire employees only. After completion of the indoctrination course, a certificate may not be issued. In this case, it suffices to keep in each individual employee's training record and/or file, a

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copy of the signed course attendance register (list) as evidence of completion of the induction.

3.2.0.7.7 Refer to Section 4.1 for detailed course contents.

## **3.2.1 Phase I: Initial Training**

3.2.1.1 In general, the aim of the *initial/familiarization* investigation training is to familiarize new investigators with the relevant aviation legislation in Nigeria and with the procedures and requirements of the Nigerian Safety Investigation Bureau. Some investigators will bring some or all of this knowledge with them when hired, others will not. Similarly, required additional knowledge, skills, and experience are illustrated on the IDP in order to assess the necessary elements of initial training.

3.2.1.2 It is an 80 hours (10 days) course which can be conducted in-house or to be locally outsourced.

3.2.1.3 Refer to Section 4.2 for detailed course contents.

## **3.2.2 Phase II: On-the-Job-Training (OJT)**

3.2.2.1 OJT is provided to a new investigator following completion of the formal classroom training. During this phase, the new investigator will practice the procedures and tasks covered in the formal classroom trainings, 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, planning investigation, witness interview techniques, liaison with international organizations, media briefings, managing investigation and leading investigation teams and coordinating family assistance program following completion of Basic and Advanced trainings.

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3.2.2.2 This training phase must be accomplished under the direct supervision of an authorized OJT Instructor/experienced investigator. The OJT together with the formal classroom training form integral part of the training program and should be scheduled to complement each other.

3.2.2.3 The conduct of OJT often involves more than one experienced investigator and is not limited to aircraft accident investigations within Nigeria. It may take the form of participation in an investigation conducted by another State as an Observer during attachment with foreign Accident Investigation Authorities (AIAs) whenever the opportunity to do so avail itself.

3.2.2.4 While OJT 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.

3.2.2.5 Records of completing OJT are captured in Investigator OJT Progress Chart (Form NSIB.04.03) – Refer to Appendix III.

3.2.2.6 OJT is an In-House training.

3.2.2.7 Instructors are expected to deliver OJT in accordance with the processes and policies specified in this manual. Delivery of OJT includes teaching the task and validating the success of the training.

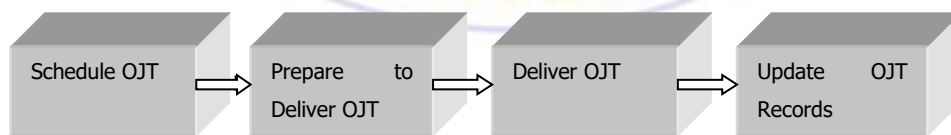


Figure: 3.1

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3.2.2.8 The OJT process follows a logical progression of three levels as shown in the table below.

<b>Level</b>	<b>Trainee</b>	<b>Instructor</b>
Level I – Knowledge	Study	Discuss
Level II – Understanding	Observe	Demonstrate
Level III – Performance	Perform	Evaluate

Table 3.1

Level I is typically a self-study effort on the part of the trainee with guided discussion and validation conducted by the OJT instructor afterwards.

Level II and III involve the actual performance of the task.

3.2.2.9 Each task assigned to a trainee requires certification at all three levels. Normally, this certification is achieved by conducting training for each of three levels. Levels I and II may be waived if the trainee had earlier attended formal classroom or computer-based training.

3.2.2.10 A typical OJT event will include some or all of the following activities:

- a) Establish a training environment
- b) Develop a rapport with the trainee
- c) State learning objectives and expected performance outcomes
- d) Review technical requirements
- e) Assess the trainee’s existing knowledge and skill in performing the task
- f) Demonstrate tasks
- g) Motivate the trainee
- h) Observe the trainee perform the task
- i) Allow sufficient time for the trainee to practice task
- j) Ask questions to check for understanding



- k) Provide explanations
- l) Review and summarize information
- m) Provide feedback and evaluate the trainee’s performance
- n) Provide additional training when necessary

### Validating Level III

3.2.2.11 To Validate Level III OJT, you (the instructor), must be able to answer “Yes” to all of the questions shown below.

	Yes	No
Did the trainee demonstrate sufficient knowledge to accurately complete the task?		
Did the trainee demonstrate all steps necessary to proficiently complete the task?		
Were the steps completed in the proper order?		
Did the trainee perform the task in a timely manner and without assistance?		

Table 3.2

3.2.2.12 At the end of each training session the instructor will validate that the trainee has successfully completed that session and the training objectives were met before notifying the Training Coordinator that training is complete.

### 3.2.2.2 Phase III Basic Training

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3.2.2.2.1 After completing the initial/familiarization training and its associated OJT, the Air Safety Investigator who is under training should attend a Basic accident investigation course as soon as is practicable, if they have not already attended such courses prior to joining the Bureau. Preferably, the basic course should be provided within the first year of attending initial/familiarization training.

3.2.2.2.2 Basic aircraft accident investigation courses should cover the following topics:

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

3.2.2.2.3 The Basic Training is a foreign outsourced course provided by recognized institutions such as Cranfield University, University of Southern California (USC), Southern California Safety Institute (SCSI), Singapore Aviation Academy, NTSB Academy, and so on.

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3.2.2.2.4 The duration of Basic Training takes between 80 -120 hours/10 – 15 days depending on the institution providing the training.

3.2.2.2.5 Refer to Section 4.3 for detailed course contents.

### **3.2.2.3 Phase IV Advanced Training**

3.2.2.3.1 As a trained investigator gains experience, he should be enrolled 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. This should be provided as soon as is practicable, preferably within the first year of completing the basic training.

3.2.2.3.2 In addition to the review of the topics in the basic course, an advanced course is desirable for preparing an air safety investigator for the responsibilities of group leader or Investigator-in-charge (IIC) of a major investigation. Such a course should aim to give the investigator an understanding of and some competence in the organization of a major accident investigation.

3.2.2.3.3 The Advanced Training is an outsourced foreign course provided by recognized institutions such as Cranfield University, University of Southern California (USC), Southern California Safety Institute (SCSI), Singapore Aviation Academy, NTSB Academy, and so on.

3.2.2.3.4 The duration of Advanced Training may take between (80 – 120) hours/ (10 – 15) days. It depends on the institution that provides the training.

3.2.2.3.5 The Advanced Training is mandatory.

3.2.2.3.6 Refer to Section 4.4 for detailed course contents.

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## 3.2.4 : Specialty Training

### 3.2.4.1 Aircraft Type Training

3.2.4.1.1 Air safety investigators may be called upon to investigate accidents involving a variety of aircraft types. It is impracticable to train an air safety investigator on each of the aircraft types that he may encounter. Nevertheless, air safety investigators should have a basic knowledge of most of the major air transport aircraft types that are operated in the country. It is therefore recommended that air safety investigators attend aircraft type courses on the most common aircraft types used by airlines in Nigeria. Preferably, such aircraft type courses should 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). There is no need for each air safety investigator to attend type courses on all the large aircraft types used in the country.

3.2.4.1.2 Training on the various aircraft types can be shared equitably among the air safety investigators. For example, one investigator could be trained on one or two large aircraft types and another investigator on other aircraft types. Air safety investigators with a technical or engineering background could attend the aircraft type courses for technical/maintenance personnel. Similarly, air safety investigators with a pilot background could attend the aircraft type courses for pilots, which could include introductory flight training in a flight simulator.

### 3.2.4.2 Phase V Specialized Trainings

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3.2.4.2.1 Specialized courses may be introduced to an ASI at any stage after a basic course. The courses would augment the skills and knowledge acquired by the air safety investigator in order to meet the needs of a particular area of accident investigation that is relevant to his assigned duties.

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

3.2.4.2.3 The short courses are organized by universities and other recognized training institutions earlier mentioned. It is the responsibility of the training coordinator to find such courses and schedule air safety investigators to attend.

3.2.4.2.4 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.

3.2.4.2.5 The Training Coordinator should contact the manufacturers of such systems for specialty courses, since most manufacturers have air safety investigators and support personnel that are familiar with the systems and the investigation techniques required to extract the information stored in the systems.

### **3.2.3.6 Phase VI: Recurrent Training**

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3.2.3.6.1 All officers of the Bureau will be provided a recurrent training as required by the specific subject matter, at an interval appropriate for each type of training.

3.2.3.6.2 Recurrent trainings should be organized for specific subjects as may be determined during assessment of training needs of each individual by his immediate supervisor or as may be required by the subject matter.

3.2.3.6.3 Generally, a formal recurrent training course contains a review of the elements found in the associated initial course, along with a discussion of any new requirements or procedures that have been established in the previous few years. The length of recurrent classroom training courses is typically 30% - 50% of the length for the initial course. Continuous performance of a specific task like instruction may exempt from a dedicated recurrent training course. Participation to seminars, workshop related to a subject matter may also be considered as maintenance of competency.

3.2.3.6.4 The curriculum for a recurrent training will aim to update the knowledge of participants with the latest techniques, amendments in procedures, guidance, policies, technologies, regulations and legislations and should highlight any specific issues relevant to the organization or lessons learned.

3.2.3.6.5 The recurrent training will be conducted in house by designated instructors and senior officers to whom specific topics will be assigned by the Training Coordinator.

3.2.3.6.6 The table 3.3 below contains specific subjects that require recurrent training and their intervals.

S/N	COURSE	RECURRENCY INTERVAL	DURATI ON	REMARKS
1	Aviation Legislation - Laws and Regulations	After amendment	3-5 days	If no change, Conduct bi-annual refresher
2	Investigation Policy and Procedures Manual (iPPM)	After amendment	3-5 days	If no change, Conduct bi-annual refresher

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3	State Safety Program/ Safety Management System	24 months	2-5 days	
4	Human Factors	24 months	5 days	
5	Flight Data Analysis	24 months	5 days	
6	Dangerous Goods Awareness	24 months	5 days	
7	Site hazard and risk management	24 months	2-3 days	
8	Accident site exercises	12 months	2-3 days	
9	Table top exercises	12 months	1 day	

Table 3.3

### 3.2.5 Additional Trainings

Additional training phase comprises of the Accident Simulation training (table-top exercises and Accident site drills), remedial training and management training, safety training, and so on.

#### 3.2.5.1 Simulation Exercises

Simulations involve Top Table Exercises and Accident Site Exercises. Simulations are organized by the Bureau using different scenarios one at a time. It is advisable to start with simple scenarios such as Photo Exercise, Use of PPE, Use of Equipment, Wreckage Mapping, etc. The goal of each exercise should be stated and there should be debrief after each exercise followed by critique. Management and all air safety investigators are involved in the simulation exercises.

The Director-General /CEO should form the group that plans the simulation exercises.

Refer to section 4.5 for detailed course contents for the Simulation Exercises.

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## 3.2.5.1.1 Table Top Exercises

3.2.5.1.1.1 The goals of Table Top exercises are essentially to enable practice different scenarios, form investigation groups, and develop team skills; and to produce investigation plan for accident site, technical phase and for the duration of the investigation (12 months).

3.2.5.1.1.2 Table Top exercises are organized once in every twelve (12) months. It may be conducted for a period of one or two days.

## 3.2.5.1.2 Accident (Crash) Site Drills

3.2.5.2.1.1 Accident or Crash Site drills or exercises may take place in the airport. It involves practice of cooperation with other agencies that are the parties normally present at accident sites such as the police, search and rescue organizations, emergency and medical services, coroners, etc.

3.2.5.2.1.2 The goals of accident site exercises are:

- a) Team building within the Bureau
- b) Practice investigation process (iPPM, Guidance materials, etc.)
- c) Practice use of equipment
- d) Practice taking high quality video/photo and systematically documenting them
- e) Help other agencies/parties involved at accident site to understand the role of Bureau

3.2.5.2.1.3 Accident site exercises should be conducted not less than once every year.

## 3.2.5.2 Phase VII Management/Leadership Courses

3.2.5.2.1 Training courses in this category provide an air safety investigator with the knowledge, skills and attitude that are required to function effectively as a supervisor, manager, training manager, or instructor. Courses in this category include Basic Supervisory Skills, Advanced Management Techniques, Instructor Training, Labor

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3.2.5.2.2 Relations, Conduct and Discipline, Systems Thinking, Strategic Planning, Financial Management, Accident Investigation Management, etc.

3.2.5.2.3 Management training can also be obtained by attending workshops, seminars, conferences and seminars conducted by aircraft accident investigation organizations, such as the International Society of Air Safety Investigators (ISASI); by reading related material such as the *Aircraft Accident Digest* circulars and aircraft accident reports issued by other States; and by exposure to major investigations as observers at major investigations on site in other States.

### **3.2.5.3 Remedial Training**

3.2.5.3.1 Remedial Training is defined as the training designed to correct the behavior of employees who have failed to perform their assigned job tasks with the knowledge, skills and the attitude expected and/or required of them; or who have otherwise demonstrated a need for additional training to bridge the identified deficiencies in basic knowledge, skills and attitude to correctly perform assigned job tasks.

3.2.5.3.2 The Remedial Training can be developed and considered as an outcome of performance evaluation process and should be provided to the personnel who need them as soon as practicably possible.

3.2.5.3.3 In addition, Remedial Training is considered when an employee made a formal request for such training upon self-evaluation and recognition that an additional training is required in order to improve his/her performance of assigned job tasks.

3.2.5.3.4 When a deficiency is identified during the staff performance evaluation process, the affected employee's immediate supervisor will recommend the appropriate remedial training to be provided to the employee to correct the identified deficiencies in knowledge, skills or behavior.

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3.2.5.3.5 A job task performed unsatisfactorily will be brought to the knowledge of the supervisor who will identify the root cause(s) of the below standard performance and recommend the appropriate remedial training to correct the job task performance.

3.2.5.3.6 The responsibility of ensuring that the Remedial Training is provided rests with the supervisors who should liaise with Training Coordinator and ensure the employee has satisfactorily completed the training.

3.2.5.3.7 The Training Coordinator should to ensure the appropriate type of training such as classroom, OJT or a combination thereof, is developed and provided to the affected personnel to ensure that the identified deficiencies are corrected and job task is performed satisfactorily to an acceptable level.

3.2.5.3.8 Identified personnel who required the Remedial Training should be released to the Training Coordinator for the period required to successfully accomplish the training.

3.2.5.3.9 The record of the Remedial Training should be also be kept in Individual Development Plan of the trainees. The records of the Remedial Training should also be included in the personnel Annual Performance Evaluation Report, including the deficiency identified, the corrective action provided and the time taken for delivering the Remedial Training.

### **3.2.3.7 Safety Training Program**

3.2.3.7.1 In order to identify and address the competencies required for effective implementation of the Sate Safety Program (SSP) and Safety Management System (SMS), taking into account the roles and responsibilities under the SSP performed by its personnel, including the aircraft accident investigation roles. These competencies are in addition to those required for the conduct of aircraft accident investigation and may be

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addressed by training existing staff or by hiring additional staff and include, but are not limited to:

- a) enhanced leadership skills;
- b) understanding of business processes;
- c) experience and judgement required to assess performance and effectiveness;
- d) safety risk-based accident investigation;
- e) safety data collection and analysis;
- f) safety performance measurement and monitoring; and
- g) safety promotion activities.

3.2.3.7.2 Guidance on the development and maintenance of a strong inspectorate workforce can be found in the *Manual on the Competencies of Civil Aviation Safety Inspectors* (Doc 10070).

3.2.3.7.3 The Bureau determines the following as the categories of SSP/SMS training that should be considered:

- a) briefings or familiarization training for senior management on SSP, SMS, safety policy, objectives and acceptable level of safety performance (ALoSP);
- b) training for Air safety investigators (ASIs) on the SSP and SMS principles, how to carry out SMS assessments, how to evaluate a service provider's SPIs for acceptance and how to generally oversee the service provider in a safety management environment;
- c) soft skills training (effective communication skills, negotiation skills, conflict resolution, etc.) to support ASIs in working collaboratively with service providers to improve safety performance while ensuring continued compliance with established regulations;
- d) training for personnel responsible for data analysis, safety objectives, SPIs and SPTs;

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- e) protection of safety data, safety information and related sources and enforcement policy training for legal personnel, etc.; and
- f) SSP and SMS training for service provider safety investigators.

3.2.3.7.4 Safety training programmes for personnel involved in SSP-related duties should be coordinated with the Nigerian Civil Aviation Authority (NCAA), as appropriate. The scope of SSP and SMS training or familiarization should reflect the actual SSP processes, and the SSP itself as it evolves and matures. Initial SSP and SMS training may be limited to generic SSP elements or SMS framework elements and guidance.

3.2.3.7.5 To ensure all relevant technical staff are properly qualified, the Bureau has developed internal training policies and procedures; and developed an SSP and SMS training programme for relevant staff. Priority is given to SSP-SMS ASIs involved in the and their relevance.

3.2.3.7.6 Many different types of SSP and SMS training are available, including online courses, classroom courses, workshops, etc. The type and amount of training provided will ensure that relevant staff develop the competence needed to perform their roles and understand their contribution to the SSP. The aim is to ensure a person or team addresses each aspect of the SSP, and that they are trained to perform the allocated role.

3.2.3.7.7 Appropriate and sufficient training for ASIs will ensure consistent surveillance and required capabilities to be effective in a safety management environment. Air safety investigators will need to complement their existing technical knowledge with additional skills to assess the suitability and effectiveness of the service providers' SMS implementation. This approach requires working in partnership with industry; to gain the trust of service providers to facilitate sharing of safety data and safety information. The Bureau will need to provide the appropriate training to ensure that personnel responsible

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for interaction with the industry have the competencies and flexibility to perform the safety investigation activities in an SMS environment. A training needs analysis can be used to identify the appropriate training.

3.2.3.7.8 The training should also provide staff with an awareness of the role and contributions of other departments within the Bureau and other Nigerian aviation authorities. This will allow ASIs as well as staff from different Nigerian aviation authorities to have a consistent approach. It will also facilitate a better understanding of safety risks across various sectors. Inspectors can also better understand how they contribute to achieving the State safety objectives.

3.2.3.7.9 Refer to Section 4.6 of this manual for the detailed curriculum and syllabi of the different categories of safety training modules, including senior management modules and Air safety investigator modules.

### 3.3.1 Training Process

3.3.1.1 When a new candidate is selected from the aviation industry or advanced program to become an air safety investigator, he is issued a Job Description for a new hire/Air Safety Officer (ASO). He must then complete the training requirements specified in this document before being given the authority to accomplish any Investigator Job Task without direct supervision.

3.1.1.2 All new hire employees normally begin training with Indoctrination training within few days of completing new-hire documentation. The new hire/ASO is provided with Initial Investigation Training. After successful completion of this training requirement, a

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new hire/ASO is then issued Bureau’s Investigator Credential, but at this point any Job Task accomplished by this employee must still be under the direct supervision of another qualified investigator or OJT Instructor.

3.3.1.3 Each air safety investigator must complete both the formal training courses and On-the-Job training on the associated procedures and tasks covered in the formal training courses and also gain familiarity with investigation techniques.

3.3.1.4 The process is illustrated as follows:

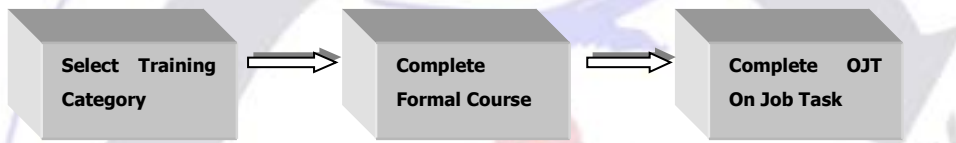


Figure 3.2

3.3.1.5 The new investigator normally continues training until he has completed training in all subject areas that comprise the *core* of investigator job functions.

3.3.1.6 Core training refers to the essential training that must be provided to each employee in order to qualify as an accident investigator. Core training requirement comprises of Indoctrination, Initial, basic and advanced.

3.3.1.7 The following flowchart depicts the typical training process for a new-hire employee all the way through final qualification as Investigator-In-Charge status. This process can be modified as necessary to accommodate special requirements.

NOTE: Specialized Trainings may be conducted in-between other trainings as at when each of the specialized courses becomes available.

## Air Safety Investigator Training Flow Chart

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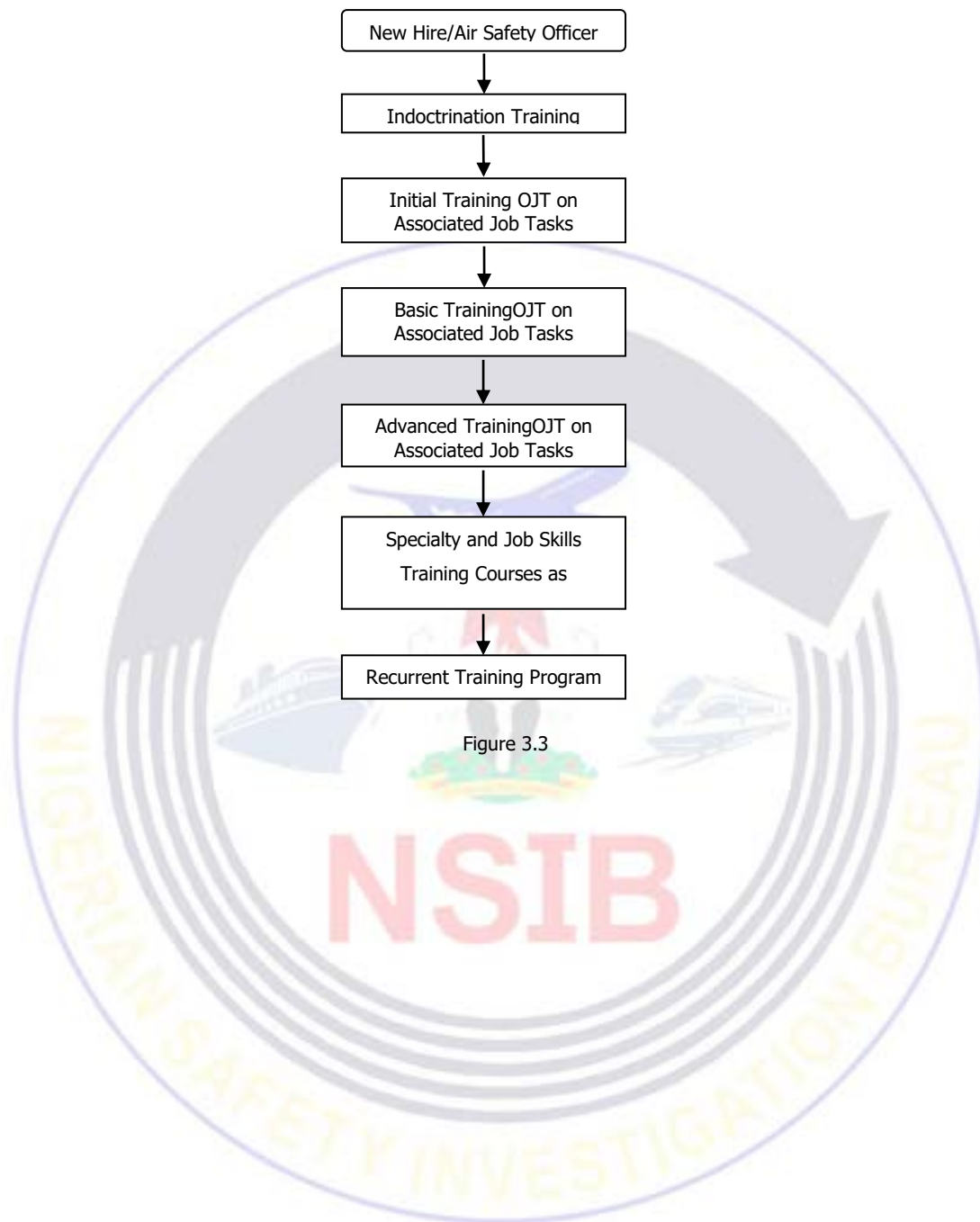


Figure 3.3

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## 3.3.2 Sequence of Training

3.3.2.1 Training a person for aircraft accident investigation involves the following sequence:

S/N	SEQUENCE	PHASE OF TRAINING	DURATION	PROVIDER
1	1 <sup>ST</sup>	Indoctrination (New Employee)	40 Hours	In-House
2	2 <sup>ND</sup>	Initial Training	80 Hours	In-House/Outsourced (Local)
3	3 <sup>RD</sup>	OJT on Initial Training	OJT Sign Off	In-House
4	4 <sup>TH</sup>	Basic Training	80-120 Hours	Outsourced (Foreign)
5	5 <sup>TH</sup>	OJT on Basic Training	OJT Sign Off	In-House
6	6 <sup>TH</sup>	Advance Training	80-120 Hours	Outsourced (Foreign)
7	7 <sup>TH</sup>	OJT on Advance	OJT Sign Off	In-House/ Attachment to foreign AIA

Table 3.4

3.3.2.2 In general, the aim of the indoctrination training is to provide a new employee with the orientation information and administrative procedures of the Bureau.

3.3.2.3 *Initial training* is to familiarize new investigators with the aviation legislation in Nigeria and with the procedures and requirements of the Nigerian Safety Investigation Bureau. Some investigators will bring some or all of this knowledge with them when hired, others will not. The specifics of prior knowledge, skills, and experience possessed by newly hired investigators are illustrated on the Individual Development Plan (IDP). Similarly, required additional knowledge, skills, and experience are illustrated on the IDP in order to assess the necessary elements of initial training.

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3.3.2.3 Following completion of the initial training, the new investigators will be provided on-the-job training. During this phase, the new investigators 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 should involve more than one experienced investigator and should not be limited to investigation within Nigeria, since international experience is necessary for all investigators.

3.3.2.4 After completing the OJT on initial training, the air safety officer will attend a Basic Accident Investigation Course as soon as is practicable, preferably within the first year of training. A Basic course should include "hands on" wreckage examination in a crash laboratory and should have a syllabus. Basic training is provided by institutions and organizations outside Nigeria.

3.3.2.5 Following the completion of formal classroom on Basic training, the new investigators will be provided OJT on the Basic investigation course. During this phase, the AISs will practice the procedures and tasks covered in the basic training, and gain familiarity with initial actions at the accident site, such as security, hazards, safety precautions Wreckage Examination, the investigators' personal equipment and protective clothing, accident site safety, protection of evidence, wreckage diagramming, collection of evidence and control of access, witness marks, and other evidence, information gathering techniques and tools; examination of maintenance documents witness interview techniques

3.3.2.6 As a trained air safety investigator at the Bureau gains experience, the ASI should be enrolled in an advanced accident investigation course where he can update his

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knowledge of the basic techniques and increase his knowledge in special areas relevant to accident investigations.

3.3.2.7 After completing the Advanced Training, the new investigators will be provided OJT on advanced investigation training. During this phase, the ASIs will practice the procedures and tasks covered in the Advanced training, such as preparing an investigator for the responsibilities of group leader or investigator-in-charge of a major investigation, cataloguing a large number of fragments of wreckage, recovery of wreckage under water, management of a large accident site, reconstruction of evidence recorded in damaged solid state recorders, preparation of briefings and answers to formal questions and Report Writing.



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## 3.3.3 Developing Training Plan

### 3.3.3.1 Introduction

3.3.3.1.1 Training Plan is the summary of trainings to be provided to employees of the Bureau for a given period. There can be periodic training plan which is designed for a period of every three years or an annual training plan which is developed every year. The Bureau uses the annual training plans approach. So, each New Year, a training plan is developed for all the employees.

3.3.3.1.2 The training plan for employees who are assigned accident investigation duties is normally based on the phases of the investigators' training programme derived from the trainings needs assessment performed by their immediate supervisors based on the job/tasks assigned to each of the employees.

3.3.3.1.3 The training plan should prioritize the type of trainings to be provided based on the availability of funds and time opportunities to permit the employees to attend the scheduled trainings.

3.3.3.1.4 Each training plan should consist of identified to be provided to each employee, the names of the beneficiary employees, the names and location of the training institutions/organizations, the duration and dates of the trainings and associated the costs of the trainings.

3.3.3.1.5 The training plan must contain the signature of the Commissioner signifying approval of the training plan.

### 3.3.3.2 Training Needs Assessment

3.3.3.2.1 In order to develop a Training Plan for the entire personnel of the Bureau, a formal training needs assessment (TNA) is necessary to ensure there is a clear understanding of the operation, the safety duties of the personnel and the available

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training. A typical TNA will normally start by conducting an audience analysis, which usually includes the following steps:

- a) Identify each staff grouping and in what ways they will interact with the aircraft accident investigation management processes, inputs and outputs - in particular with safety/ investigation duties. This information should be available from the position/role descriptions. Normally groupings of individuals will start to emerge that have similar learning needs;
- a) Identify the knowledge and competencies needed to perform each safety duty and required by each staff grouping;
- b) Conduct an analysis to identify the gap between the current skill and knowledge across the workforce and those needed to effectively perform the allocated safety/investigation duties;
- d) Identify the most appropriate skills and knowledge development approach for each group with the aim of developing a training programme appropriate to each individual or group's involvement in safety/investigation management. The plan should also consider the staff's ongoing knowledge and competency needs; these needs will typically be met through a recurrent training programme.

3.3.3.2.2 It is also important to identify the appropriate method for training delivery. The main objective is that, on completion of the training, personnel are competent to perform their SMS duties. Competent trainers are usually the single most important consideration; their commitment, teaching skills and expertise will have a significant impact on the effectiveness of the training delivered.

3.3.3.2.3 The Immediate supervisor will determine who should be trained and to what depth, and this will depend on their involvement in the safety/ investigation processes management. Most people working in the organization have some direct or indirect relationship with aviation safety investigation, and therefore have some related duties. This applies to any personnel directly involved in the aircraft accident investigation. Some

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administrative and support personnel will have limited safety investigation duties and will need some limited familiarization training, as their work may still have an indirect impact on safety.

The training needs assessment is conducted for each individual personnel using the Bureau's Form NSIB.04.06.

3.3.3.2.5 The main purpose of the Bureau's Annual Training Plan is to ensure that personnel, at all levels of the Bureau, maintain their competence to fulfil their safety investigation roles; therefore competencies of personnel should be reviewed on a regular basis.

3.3.3.2.6 The Annual Training Plan is developed by the Training Coordinator in conjunction with the operational heads of safety investigation departments and the human resources and approved by the Director-General /CEO as a guide during the preparation phase of annual budgetary processes to ensure training funds are secured.

3.3.3.2.7 The Training Plan is usually developed for each financial year, however, it also contain the carried forward elements of the preceding year's training courses planned but not been accomplished due to several reasons.

3.3.3.2.8 The Training Coordinator initiates the above process by distributing the TNA Form to all employees through their respective heads of department/unit. The employees will fill in the required portions of the TNA Forms and submit to their heads of departments/units who in turn complete their portions and forward to the Director-General /CEO for approval. The Director-General /CEO will forward the approved TNA forms to the Director of Human Resources, the head of Finance and Accounts and the Training Coordinator for budgeting, sourcing of training providers and implementation.

### **3.3.3.3 Individual Development Plan (IDP)**

A Microsoft Excel Sheet tool named *individual development Plan (IDP)* is developed to manage the entire training program of all personnel assigned aircraft investigation related duties. The Individual Development Plan (IDP) is used in conjunction with the Training

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Needs Assessment Forms completed by each individual investigator. The information is used to develop Annual Training Plan to ensure each individual receives training as required by their assigned duties and responsibilities. It also contains list of courses attended and or yet to attend by the investigators. The chart serves as a quick training gap assessment to determine the training needs of each investigator.

3.3.3.3.2 Each newly hired person possesses some knowledge, skills, and abilities applicable to the assigned tasks; however, the level from one person to another varies. For example, two highly qualified operations investigators could possess extensive flight operations background, but one may only have limited incident investigation experience, while the other may have considerable major accident investigation experience. Further, investigators require different levels of knowledge, skills, and abilities, depending on the investigation roles to which they may be assigned. The IDP is an excellent tool for identifying and managing these variables.

### **3.3.3.4 Making the Annual Training Plan**

3.3.3.4.1 The training coordinator should use the Individual Development Plan (IDP) (Form: NSIB.04.02) in conjunction with the Training Needs Assessment Forms (NSIB.04.06) completed for each individual employee to develop an Annual Training Plan to ensure each individual employee receives training aligned with their involvement, duties and responsibilities.

3.3.3.4.2 The main purpose of the Bureau's Annual Training Plan is to ensure that personnel, at all levels of the Bureau, maintain their competence to fulfil their safety investigation roles; therefore, competencies of personnel should be reviewed on a regular basis through the performance evaluation process.

3.3.3.4.3 The Annual Training Plan is developed by the training coordinator in conjunction with immediate supervisor of each investigator.

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3.3.3.4.4 The annual training plan is approved by the Commissioner as a guide during the preparation phase of the Bureau’s annual budgetary processes to ensure provision for funding for the execution of the approved training plan.

3.3.3.4.5 The Annual Training Plan is usually developed for each financial year; however, it also contains the carried forward elements of the preceding year’s training courses planned but not been accomplished due to several reasons.

3.3.3.4.6 Any training not accomplished in the previous budget year should be considered in the next budget year and should form part of the new annual training plan.

### 3.3.4 Training and Competency Requirements

The table below provides the performance and competence expected of air safety investigators at every grade level and the training required for filling the gaps as the investigator progresses in his carrier development.

Seniority of Investigator	Training and Experience to be provided as far as is practicable	Skills and performance capability expected of investigators
New Accident Investigator All Grade Levels	<ul style="list-style-type: none"> <li>● Indoctrination</li> <li>● Initial Training</li> <li>● Basic Aircraft accident investigation techniques and regulations</li> <li>● Aircraft accident investigation management</li> <li>● Organizational factors</li> <li>● Human factors/Safety Management</li> <li>● Site safety and blood borne pathogen avoidance</li> <li>● Media handling</li> <li>● On-the-job training</li> <li>● Crash exercises</li> <li>● Mobilization turn-ups</li> <li>● Reading and reviewing safety and investigation reports</li> <li>● Writing Bureau Safety Information articles</li> </ul>	



<p>Grade Levels 08 – 10 and New Accident Investigator Grade Level 12 and above</p>	<ul style="list-style-type: none"> <li>• Member of investigation team for GA/nil fatality/non-complex occurrences, including understudying the IIC</li> <li>• Being IIC for GA/nil fatality/non-complex occurrences</li> <li>• Member of investigation team for a more serious occurrence, including understudying the IIC or investigation sub-group chairman</li> <li>• Drafting investigation sub-group reports or final reports</li> <li>• Opportunities to critique other Bureau draft reports</li> </ul>	<ul style="list-style-type: none"> <li>• Able to apply investigation legislation, Annex 13 standards and recommended practices and ICAO guidelines</li> <li>• Demonstrate resourcefulness</li> <li>• Able to adapt or improvise</li> <li>• Able to attend to details</li> <li>• Able to write clearly and concisely</li> <li>• Able to ask related questions</li> <li>• Able to identify and muster resources needed for investigation</li> <li>• Able to perform as an effective member of an investigation team</li> </ul>
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**Table 3.5**

<b>Seniority of Investigator</b>	<b>Training and Experience to be provided as far as is practicable</b>	<b>Skills and performance capability expected of investigators</b>
<p>Accident Investigator Grade Levels 12-13 and New Accident Investigator Grade Level 14 and above</p>	<ul style="list-style-type: none"> <li>• Relevant specialty courses</li> <li>• Relevant advanced training</li> <li>• Recurrent training on relevant topics</li> <li>• Relevant safety and investigation conferences and seminars</li> <li>• Crash exercises</li> <li>• Member of investigation team for relatively complex occurrence or occurrence with few fatalities, including understudying the IIC</li> <li>• Being IIC for relatively complex occurrence or occurrence with few fatalities</li> <li>• Member of investigation team for major accident or occurrence with many fatalities, including understudying the IIC or investigation sub-group chairmen</li> </ul>	<ul style="list-style-type: none"> <li>• All of the above, plus:</li> <li>• Able to draw up investigation plan, with attention to details</li> <li>• Able to perform effectively as IIC for investigation of General Aviation or nil fatality or non-complex occurrence, including drafting of investigation report</li> <li>• Able to manage the Accident Investigation Command Centre</li> <li>• Attachments to foreign investigations</li> <li>• Relevant safety and investigation conferences and seminars</li> </ul>



	<ul style="list-style-type: none"> <li>• Being investigation sub-group chairman for investigation of major accident or occurrence with many fatalities</li> <li>• Drafting investigation sub-group reports or draft final reports</li> <li>• Opportunities to critique other Bureau's reports</li> <li>• Reading and reviewing safety and investigation reports</li> <li>• Writing Bureau's Safety Information articles</li> <li>• Attachments to foreign investigations</li> <li>• Investigation assistance to other States</li> <li>• Relevant safety and investigation conferences and seminars</li> <li>• ICAO and other international/regional meetings on Annex 13 related matters</li> <li>• Basic Supervisory Skills,</li> <li>• Instructional Techniques</li> </ul>	
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Table 3.5 Cont.





Seniority of Investigator	Training and Experience to be provided as far as is practicable	Skills and performance capability expected of investigators
Accident Investigator Grade Levels 14-15 and New Accident Investigator Grade Level 16 and above	<ul style="list-style-type: none"> <li>● Relevant specialty courses</li> <li>● Relevant advanced training</li> <li>● Recurrent training on relevant topics</li> <li>● Attachment to foreign investigations</li> <li>● Investigation assistance to other States</li> <li>● Relevant safety and investigation conferences and seminars</li> <li>● ICAO and other International/regional meetings on Annex 13 related matters</li> <li>● Advanced Management Techniques</li> </ul>	<ul style="list-style-type: none"> <li>● All of the above, plus:</li> <li>● Able to perform effectively as IIC for investigation of relatively complex occurrence or occurrence with few fatalities, including completion of investigation report</li> <li>● Able to perform as deputy IIC for investigation of major accident or occurrences with many fatalities, including drafting of investigation report</li> <li>● Able to critique, draft and review reports for complex and major investigations</li> <li>● Able to face the media at interview</li> <li>● Able to be formal training instructor</li> <li>● Able to be OJT Instructor</li> <li>● Able to lead investigation group</li> <li>● Able to manage training</li> </ul>
Accident Investigator Grade Level 16 and New Accident Investigator Grade Level 17 and above	<ul style="list-style-type: none"> <li>● Relevant specialty courses</li> <li>● Relevant advanced training</li> <li>● Recurrent training on relevant topics</li> <li>● Attachment to foreign investigations</li> <li>● Investigation assistance to other States</li> <li>● Relevant safety and investigation conferences and seminars</li> <li>● ICAO and other International/regional meetings on Annex 13 related matters</li> <li>● Advanced Management Techniques</li> </ul>	<ul style="list-style-type: none"> <li>● All of the above, plus:</li> <li>● Capable of conducting complex and/or major investigations</li> <li>● Developed managerial skills and ability to define, set and review objectives and report on the work of a team(s)</li> <li>● Able to use leadership skills to develop and maintain harmony in teams</li> <li>● Able to critique draft reports</li> <li>● Able to guide and supervise the work of Grade 8-15 investigators</li> <li>● Able to perform effectively as a deputy IIC or an investigation sub-group chairman in relative complex occurrence or occurrence with few fatalities</li> <li>● Able to draft press release</li> <li>● Able supervise small group of investigators</li> <li>● Able to train other investigators (instructor of Initial training course)</li> </ul>

Table 3.5 Cont.



Seniority of Investigator	Training and Experience to be provided as far as is practicable	Skills and performance capability expected of investigators
Accident investigator Grade Levels 17 and above	<ul style="list-style-type: none"> <li>● Relevant specialty courses</li> <li>● Relevant advanced training</li> <li>● Recurrent training on relevant topics</li> <li>● Attachment to foreign investigations</li> <li>● Investigation assistance to other States</li> <li>● Relevant safety and investigation conferences and seminars</li> <li>● ICAO and other international/regional meetings on Annex 13 related matters</li> <li>● Labor and Industrial Relations</li> <li>● Conduct and Discipline</li> <li>● Systems Thinking</li> <li>● Strategic Planning</li> </ul>	<ul style="list-style-type: none"> <li>● All of the above, plus:</li> <li>● Able to guide investigators in their investigation of relatively complex occurrence or occurrence with few fatalities and critique the related draft reports</li> <li>● Able to guide investigators undertaking IIC or investigation sub-group chairman role in relatively complex occurrence or occurrence with few fatalities</li> <li>● Able to draft comprehensive public reports of major investigations</li> <li>● Capable of providing on-site media briefing</li> <li>● Capable of providing briefing to minister</li> <li>● Able to perform as IIC for investigation of major accident or occurrences with many fatalities, including completion of investigation report</li> <li>● Able to lead and manage all complex and/or major investigations as IIC</li> <li>● Able to mentor senior investigator undertaking IIC role in complex investigations</li> <li>● Able to draft comprehensive public reports of major investigations</li> <li>● Able to face the media as a member of a press conference panel for release of facts or report</li> </ul>

Table 3.5 Cont.





## 3.3.5 Training Evaluation

3.5.0.1 The evaluation of training is conducted in two phases, namely the evaluation of the conduct of the training course and the evaluation of the trainee's work performance after completion of the training.

3.5.0.2 The primary objective of the training evaluation is to determine if the training goals are achieved by measuring the impact of the training on the trainees work performance and professional competence using the analysis of the opinion questionnaires to improve the quality of future course materials and delivery.

3.5.0.3 Measuring the impact of the training on the trainee's work performance can be conducted between three (3) and six (6) months after completion of the training.

### 3.3.5.1 Evaluation of the Training Course

3.3.5.1.1 The Training Coordinator will regularly evaluate each course for its contents, time, quality of the training materials, training facilities and instructor. This is accomplished through observation, examination results, evaluation and feedback from trainees through the use of course critique.

3.3.5.1.2 The trainees also are given opportunity to evaluate the training by completing training evaluation (Opinion Questionnaire) on the last day of the training, in which the trainees assess the training materials, training environment, training aids, training duration and the performance of the instructor.

3.3.5.1.3 Course evaluation procedure will help the instructor and the Training Coordinator establish how the course affected the trainees' reaction, learning, behavior and results as follows:

- a) How well did the trainees like the course

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- b) To what extent did the trainees learn the facts, principles and approaches that were included in the classroom training
- c) To what extent did the trainees' job behavior change because of the course and
- d) What were the final results achieved

3.3.5.1.3 If deficiencies are discovered or an investigator demonstrates lack of knowledge or skill, then Training Coordinator will take appropriate action to correct any problems that may affect effectiveness of the course.

### **3.3.5.2 Evaluation of Trainees Work Performance**

3.3.6.2.1 The Training Coordinator should liaise with immediate supervisors of the trainees to conduct evaluation of the impact of the training on work performance of the trainees.

3.3.6.2.2 The evaluation may commence about three (3) to six (6) months after completion of the training. The evaluation is conducted using the Evaluation Questionnaire to be completed by the immediate Supervisor of the trainees.

3.3.6.2.3 The result of the analysis of the evaluation of the work performance of the trainee may be considered as one of the basis for training needs assessment of the affect staff.

### **3.3.6 Training Records**

#### **TRAINING RECORDS**

3.3.6 The NSIB shall establish, update and maintain training records of technical personnel in hard and electronics copies in a secured manner as provided for in this manual.

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3.3.6.1 It is imperative that an accurate and permanent record be created to record the training status of each Investigator. This record should be meticulously maintained from the time the Investigator is hired into the Bureau until the time he retires from the employment of the Bureau.

3.3.6.2 The Investigators training record consists of

- (a) Training certificates
- (b) Annual training plan,
- (c) Individual training plan
- (d) Training need assessment
- (e) Training evaluation
- (f) OJT certificate and Progress chart
- (g) The Individual development plan.
- (h) Copy of License/Ratings

3.3.6.3 The training record is kept in both hard paper copy and electronic format. The electronic format may be stored on the designated electronic platform such as Microsoft office on the Bureau's Workstation (Microsoft SharePoint) or electronic document management system.

### **3.3.6.2 Procedures for electronic training records keeping**

- a) All training attendees should within 7 days from day of completion of the training submit the training certificate to the training coordinator.
- b) The training coordinator should submit copies of training records (certificates) to ICT Unit to be stored on the designated electronic platform such as Microsoft office on the Bureau's Workstation (Microsoft SharePoint) or electronic document management system.
- c) All the scan documents shall be converted into PDF format
- d) Access to all approved documents stored on the designated electronic Management system by the training coordinator.

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### 3.3.6.3 Procedures for non-electronic training records

- a) All training attendees should within 7 days from day of completion of the training submit the training certificate to the training coordinator for update of the trainee's records.
- b) Upon receipt of the evidence of completion of training, the Training Coordinator should update the individual training records as appropriate and handover the paper copy to Human Resource Department for inclusion into the individual training file.
- c) Human resources shall keep a copy of all non-electronic training certificates in the individual training files.
- d) Individuals are required to keep the original copies of their certificates and make available on demand
- f) The paper individual personnel training files are updated to capture all the courses attended by the investigator. The files are kept by the Human Resource Department.

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## CHAPTER 4 TRAINING SYLLABUS

This chapter provides a description of the minimum standards and content that should be included in formal classroom training courses provided to investigators in accordance with the phases of training already described in chapter 3 of this manual. It applies to the initial training courses ONLY. The training materials (handouts and power point presentations) for the in-house courses are in custody of the Training Coordinator.



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## 4.1 INDOCTRINATION TRAINING

The following subjects recommended for the Indoctrination training:

<b>Title</b>	<b>Indoctrination Training- ONE-OFF TRAINING</b>
<b>Duration</b>	40 Hours (5 Days)
<b>Objectives</b>	<p>On completion of the training participants will have:</p> <ul style="list-style-type: none"> <li>❖ An appreciation of our Corporate Plan and an understanding of how the objectives affect you.</li> <li>❖ An understanding of how internal processes and policies work.</li> <li>❖ An understanding of the benefits available to him when working at the Bureau</li> </ul>
<b>Description</b>	This course is designed for newly hired employees of the Bureau. It presents orientation information concerning the Bureau. Course subjects include history, mission and philosophy of the Bureau.
<b>Contents</b>	
<b>Day 1</b>	<ul style="list-style-type: none"> <li>❖ Introduction</li> <li>❖ Aims and objectives of the induction Program</li> <li>❖ The History of the Bureau and its enabling Laws                         <ul style="list-style-type: none"> <li>➤ History of Accident investigation in Nigeria</li> <li>➤ Creation of the Bureau</li> <li>➤ Objectives of the Bureau</li> <li>➤ Mission and Vision Statement of the Bureau</li> <li>➤ Relationship with Ministry of Transportation (Aviation) and other aviation agencies</li> </ul> </li> <li>❖ Introduction to aviation legislation                         <ul style="list-style-type: none"> <li>➤ Civil Aviation Act of 2006</li> <li>➤ Civil Aviation (Air Accident &amp; Incident Investigation) Regulations or the Bureau regulations</li> <li>➤ Brief history of Chicago Convention</li> <li>➤ ICAO Annexes and Documents</li> </ul> </li> <li>❖ Work Procedures and Rules and regulations</li> <li>❖ Bureau's Organizational Structure and services provided by it</li> <li>❖ Introduction of Activities of Directorates</li> </ul>



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<p><b>Day 2</b></p>	<ul style="list-style-type: none"> <li>❖ How Bureau's Work Culture</li> <li>❖ Ethical Standards                         <ul style="list-style-type: none"> <li>➤ The Dos and Don'ts at the Bureau</li> <li>➤ Obligations and Office Norms and Conduct</li> </ul> </li> <li>❖ Administrative procedures                         <ul style="list-style-type: none"> <li>➤ Office hours</li> <li>➤ Travel and Per Diem policies</li> <li>➤ Dress codes</li> <li>➤ Leave</li> <li>➤ Staff matters (promotion, retirement and discipline)</li> </ul> </li> <li>❖ Staff welfare</li> <li>❖ Interpersonal Relationship at work</li> </ul>
<p><b>Day 3</b></p>	<ul style="list-style-type: none"> <li>❖ Team Building and team work</li> <li>❖ Overview of Customer Services</li> <li>❖ Overview of ICT                         <ul style="list-style-type: none"> <li>➤ Use of ICT infrastructure, including internet access</li> <li>➤ Restricted access to and use of Confidential information</li> <li>➤ Use of company emails and telephones</li> <li>➤ Use of software</li> </ul> </li> <li>❖ The Bureau Corporate Plan</li> </ul>
<p><b>Day 4</b></p>	<ul style="list-style-type: none"> <li>❖ Introduction to Public service Rules</li> <li>❖ The Role of a Public Servant</li> <li>❖ Bureau Condition of Service</li> <li>❖ Business Etiquette and Protocol Skills                         <ul style="list-style-type: none"> <li>➤ Customer Service Principles</li> <li>➤ Professionalism</li> <li>➤ Effective Communications Skills</li> </ul> </li> <li>❖ Individual responsibilities and Ownership Culture</li> <li>❖ Financial Regulations</li> </ul>
<p><b>Day 5</b></p>	<ul style="list-style-type: none"> <li>❖ Probity</li> <li>❖ A tour of the Bureau Offices and Accident sites (where possible)</li> <li>❖ Program Evaluation and Closing</li> </ul>





<b>Prerequisites</b>	None
<b>Associated Training Course</b>	None
<b>Revision Date</b>	4 January 2022



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## 4.2 INITIAL TRAINING

This section contains the course contents for Initial Formal classroom training and the OJT on the Initial training. In general, the aim of the *initial training* is to familiarize new investigators with the relevant aviation legislation in Nigeria and with the procedures and requirements of the Nigerian Safety Investigation Bureau.

### 4.2.1 Initial Formal Classroom Training

The following subjects are recommended to be included in the initial training:

<b>Title</b>	<b>Initial Training - ONE-OFF TRAINING</b>
<b>Duration</b>	80 hours (10 Days)
<b>Objectives</b>	<p>On completion of the training participants will have:</p> <ul style="list-style-type: none"> <li>❖ knowledge of aviation legislation in Nigeria</li> <li>❖ Knowledge of ICAO Annexes and Documents relating to accident investigation.</li> <li>❖ Knowledge of the initial responses.</li> <li>❖ An understanding of the accident investigation process.</li> <li>❖ Ability to begin OJT for the specific Job tasks associated with the subjects of Initial Training.</li> </ul>
<b>Description</b>	This course is designed for newly hired aircraft accident investigators of the Bureau. It is aimed to familiarize new investigators with the relevant aviation legislation and with the procedures and requirements of the Bureau.
<b>Contents</b>	<p>Administrative arrangements</p> <ul style="list-style-type: none"> <li>❖ Applicable ICAO documentation (ICAO Annex 13, ICAO Doc.9756, ICAO Doc. 9962, Doc. 9946, Doc. 9998, Doc. 10062, Doc. 9859; etc</li> <li>❖ Relevant Sections of Aviation Act 2006, Civil Aviation (Investigation of air Accidents and Incidents) Regulations, Nigeria Civil Aviation Regulations, Powers of investigators, Confidentiality of information;</li> <li>❖ International agreements (including Annex 13 — <i>Aircraft Accident and Incident</i></li> </ul>

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	<ul style="list-style-type: none"> <li>❖ <i>Investigation</i>);</li> <li>❖ Memoranda of understanding with other organizations;</li> <li>❖ Liaison arrangements with local and national authorities;</li> <li>❖ Management Structure of the Nigerian Safety Investigation Bureau;</li> <li>❖ Aircraft accident investigation manuals and Procedures;</li> <li>❖ Definitions and accident classification;</li> <li>❖ Equipment and tools;</li> <li>❖ Transport arrangements;</li> <li>❖ Ethics and conduct; and</li> <li>❖ Expenditure control.</li> </ul>
Contents	<p>Initial response procedures</p> <ul style="list-style-type: none"> <li>❖ On-call procedures;</li> <li>❖ Notification of other national authorities and organizations;</li> <li>❖ Securing of records, recordings and samples;</li> <li>❖ Accident site jurisdiction and security;</li> <li>❖ Investigator safety including psychological stress;</li> <li>❖ Recovery of human remains;</li> <li>❖ Requests for autopsies; and</li> <li>❖ Family assistance.</li> </ul>
	<p>Investigation procedures</p> <ul style="list-style-type: none"> <li>❖ Authority and responsibility;</li> <li>❖ Size and scope of the investigation;</li> <li>❖ Investigation management;</li> <li>❖ Use of specialists;</li> <li>❖ Parties to the investigation, accredited representatives, advisers and observers; and</li> <li>❖ Release of information to the news media.</li> </ul>
<b>Prerequisites</b>	Indoctrination Training
<b>Associated Training Course</b>	None
<b>Revision Date</b>	4 January 2022



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## 4.2.2 OJT 1 (Following Initial Training)

4.2.2.1 Following completion of the initial training, the new investigator will practice the procedures and tasks covered in the initial training, and gain familiarity with investigation techniques. The new investigators will be tasked to support the experienced investigators in new or on-going investigations.

4.2.2.2 This OJT 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.

4.2.2.3 All these OJT activities will be recorded on OJT Progress Chart Form NSIB.04.03.

<b>Title</b>	<b>On-the-Job-Training (OJT) 1</b>
<b>Duration</b>	OJT sign off
<b>Objectives</b>	On completion of this OJT participants will be able to: <ul style="list-style-type: none"> <li>❖ Demonstrate knowledge of ICAO Annex 13 and the associated Documents</li> <li>❖ Fill out Notification Forms</li> <li>❖ Demonstrate practical skills in research and collection of factual information, interviews, documenting evidence on site</li> <li>❖ Organize logistics</li> <li>❖ Draft reports</li> </ul>
<b>Description</b>	This course is designed for newly hired aircraft accident investigators of the Bureau. It is aimed to expose new investigators to investigation tasks by attaching them to experienced investigators in new or on-going investigations
<b>Contents</b>	<ul style="list-style-type: none"> <li>❖ Review of Annex 13 and Doc. 9756</li> <li>❖ Notification of foreign Accident Investigation Authorities</li> <li>❖ Collection factual information (documenting evidence, Witness interviews, Transcription of CVR recordings, supervision of tests)</li> <li>❖ Analysis</li> <li>❖ Writing Draft Final Report</li> </ul>

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<b>Prerequisites</b>	Initial Training
<b>Associated Training Course</b>	None
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## 4.3 BASIC TRAINING

This section contains the course contents for Basic Formal classroom training and the OJT on the Basic training.

### 4.3.1 Basic Formal Classroom Training

Basic aircraft accident investigation courses should cover the following topics:

<b>Title</b>	Basic Training - <b>ONE-OFF TRAINING</b>
<b>Duration</b>	80 - 120 hours (10 - 15 Days)
<b>Objectives</b>	<p>On completion of the Basic Training participants will be able to:</p> <ul style="list-style-type: none"> <li>❖ Describe the accident investigation process for a transport accident, including elements of preparation, emergency response, evidence collection and analysis, report writing and safety recommendations</li> <li>❖ Work safety under supervision at an accident site</li> <li>❖ Conduct witness interviews and collect material evidence from a variety of relevant sources</li> <li>❖ Perform analysis of evidence to develop a final report</li> <li>❖ Critically assess strategies for working alongside interested parties including emergency services, legal, pathologist, news media, families and foreign authorities</li> </ul>
<b>Description</b>	This course is designed for trainee investigators of the Bureau, who may become involved in future aircraft accident investigations in any capacity and need to understand basic investigation technology. It focuses on the fundamental skills required by an accident investigator
<b>Contents</b>	<p><i>General introduction.</i>  <i>Legislation and Regulations</i></p> <ul style="list-style-type: none"> <li>❖ <i>Appraisal of the Accident Site</i></li> <li>❖ <i>Disaster Response</i></li> <li>❖ <i>Recovery Of Wreckage</i></li> <li>❖ <i>Collection of Evidence</i></li> <li>❖ <i>Accident Photography</i></li> <li>❖ <i>Hazards Management On site</i></li> <li>❖ <i>Wreckage Recovery</i></li> <li>❖ <i>Interviewing techniques</i></li> </ul>

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	<ul style="list-style-type: none"> <li>❖ <i>Structures and Crashworthiness</i></li> <li>❖ <i>Human Factors for Investigators</i></li> <li>❖ <i>Media Management</i></li> <li>❖ <i>Accident Pathology</i></li> <li>❖ <i>Data recorders and their Analyses</i></li> <li>❖ <i>Analytical Techniques</i></li> <li>❖ <i>Systemic Approach to investigation</i></li> <li>❖ <i>Managing Investigations</i></li> <li>❖ <i>Liason with victims and their Families</i></li> <li>❖ <i>Relations with the Regulation/interested Parties</i></li> <li>❖ <i>Developing and Managing Recommendations</i></li> <li>❖ <i>Report Writing</i></li> <li>❖ <i>Follow-up Actions</i></li> <li>❖ <i>Court Procedures for Investigators</i></li> <li>❖ The history of aircraft accident investigation</li> <li>❖ the development of the international agreements on the conduct of investigations,</li> <li>❖ The Standards and Recommended Practices (SARPs) adopted by ICAO and its Contracting States in the field of aircraft accident investigation.</li> <li>❖ The responsibilities of the States involved, as defined in Annex 13 — <i>Aircraft Accident and Incident Investigation</i></li> <li>❖ The applicable international agreements and SARPs are contained in Annex 13 — <i>Aircraft Accident and Incident Investigation</i> to the Convention on International Civil Aviation. Relevant guidance material is provided in the <i>Manual of Aircraft Accident Investigation</i> (Doc 6920) and <i>Manual of Aircraft Accident and Incident Investigation</i> (Doc 9756). A review of these documents and their salient points is required so that the investigator knows where to find the information on the relevant topics. General guidance should also be given on the investigation of accidents involving unlawful interference, both civil and military aircraft or facilities, and inaccessible or missing aircraft.</li> </ul>
	<p><b><i>Accident notification procedures.</i></b></p> <ul style="list-style-type: none"> <li>❖ The accident notification systems and the appropriate responses to be expected from each State and organization that are notified.</li> <li>❖ The ways on how the notification of the occurrence of an accident initiates the process of an investigation.</li> <li>❖ 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.</li> <li>❖ The requirements of Annex 13 in relation to this phase of an investigation.</li> </ul>





	<ul style="list-style-type: none"> <li>❖ Preparation for overseas travel in the form of passports and visas and airport airside passes should be reviewed, as should the benefits of access provided by the international agreements inherent in Annex 9 — <i>Facilitation</i>.</li> </ul>
	<p><b><i>Investigation management.</i></b></p> <ul style="list-style-type: none"> <li>❖ The role of the investigator, the skills he will need to acquire, and the accident investigation process.</li> <li>❖ The value of assessing the availability of resources (such as funding, personnel, equipment and buildings)</li> <li>❖ The planning for the investigation of a major accident beforehand.</li> <li>❖ 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.</li> <li>❖ An appreciation of the realities of the limits imposed by the resources available and the optimum use of those resources.</li> <li>❖ The value of memoranda of understanding with departments and organizations that might be involved in an investigation.</li> </ul>
	<p><b><i>Investigators' equipment.</i></b></p> <ul style="list-style-type: none"> <li>❖ The factors determining the equipment to be used during investigations (availability, cost and the means available to transport it to the site).</li> <li>❖ The use of contemporary aids such as global positioning systems (GPS), satellite telephones, and data links back to base, as well as on the use of basic items such as compasses and inclinometers.</li> <li>❖ Means of recording in extreme wet or cold conditions.</li> <li>❖ The proper method of taking samples of aircraft fluids and the appropriate containers should also be included.</li> </ul>
	<p><b><i>Accident site safety.</i></b></p> <ul style="list-style-type: none"> <li>❖ The safety of personnel at an aircraft accident site.</li> <li>❖ The 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.</li> <li>❖ The 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.</li> <li>❖ Demonstrating the use of protective equipment against airborne and blood borne pathogens.</li> <li>❖ Special consideration on utilities such as gas mains, electricity transmission lines and main transport routes.</li> </ul>



	<ul style="list-style-type: none"> <li>❖ A plan for aid and rescue in the event of an accident involving personnel at the site (requirements by many occupational health and safety organizations).</li> </ul> <p><b><i>Protection of evidence.</i></b></p> <ul style="list-style-type: none"> <li>❖ To establish a suitable environment for a competent examination of the area and the accident debris, measures should be taken to protect the wreckage from fires, meteorological hazards and souveniring.</li> <li>❖ The need to give priority to recording transient evidence, securing light objects that may be lost in the wind, and recording ground scars and other site markings that may become obliterated should be addressed.</li> <li>❖ The conduct of interviews with the rescue personnel should also be discussed in order to facilitate the determination of the movement of items of wreckage, which they may have caused inadvertently.</li> </ul> <p><b><i>Initial action at the accident site.</i></b></p> <ul style="list-style-type: none"> <li>❖ The investigator should 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.</li> <li>❖ 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.</li> </ul> <p><b><i>Information gathering techniques.</i></b></p> <ul style="list-style-type: none"> <li>❖ The investigator under training should be introduced to the methods of gathering and reviewing relevant documentation and procedures;</li> <li>❖ The interview techniques used for different types of witnesses; the transcription of air traffic services and other recordings; and</li> <li>❖ The review of aerodrome facilities, emergency services responses and meteorological data.</li> </ul>
<p><b>Contents</b></p>	<p><b><i>Communication and recording media.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ Digital video cameras and digital cameras, standard film photography, laptops and hand-held computers with connections via satellite 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.</li> </ul>



	<ul style="list-style-type: none"> <li>❖ As each type of equipment is evolving rapidly, it is an essential subject in the training of an investigator.</li> </ul>
	<p><b><i>Witness interviews.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ They may be a visual witness who saw an event or an aural witness who heard a sound or relevant conversation.</li> <li>❖ 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 must be considered.</li> <li>❖ 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 should be discussed.</li> </ul>
	<p><b><i>Recorders.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The value of each form of recorder, the methods of interpreting and downloading the information, and the sources of readout must be in the course syllabus.</li> <li>❖ 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) should be explored.</li> <li>❖ Another aspect of importance is the means of locating the flight recorders and recovering them from locations that are difficult to reach.</li> <li>❖ Recorders at air traffic services facilities, particularly those that record radar returns, should be the subject of a separate study and guidance regarding their potential use to an investigation.</li> </ul>
	<p><b><i>Examination of relevant maintenance documents.</i></b></p> <ul style="list-style-type: none"> <li>❖ The maintenance history of the aircraft is established primarily from the records held by the operator.</li> <li>❖ 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.</li> </ul>



	<p><b><i>Fires and explosions.</i></b></p> <ul style="list-style-type: none"> <li>❖ The evidence available to distinguish an in-flight fire or explosion from post-accident fires forms a valuable lesson that must be passed on to the new investigator.</li> <li>❖ The means of determining the ignition source and the fuel supply of a fire are important.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Survival aspects.</i></b></p> <ul style="list-style-type: none"> <li>❖ The chances of occupants surviving an accident can be assessed and the means to do so should be given to the accident investigator.</li> <li>❖ The investigator should know the formulae for impact force calculations and the various forms of attenuating impact forces.</li> <li>❖ 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.</li> <li>❖ 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 are items that should be studied under this heading.</li> <li>❖ It is also very important to review the factors that affect the occupants' chances of surviving the accident.</li> <li>❖ The means of determining the after effects of a fire on the occupants and the fire's impediment to passenger evacuation must be discussed, as must the availability of such items as smoke hoods and smoke goggles.</li> <li>❖ 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.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Structures.</i></b></p> <ul style="list-style-type: none"> <li>❖ As the basis for the examination of the wreckage, the study of structures is an area of prime interest to the investigator.</li> <li>❖ The study of structures should comprise metallurgy, fiber reinforced plastics and timber structures, stress analysis and the strength of these materials. It should also include the various modes of failure and the characteristics of such failures in the materials used in aircraft structures.</li> <li>❖ 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.</li> </ul>



	<ul style="list-style-type: none"> <li>❖ The various types of flight controls and landing gear structures should also be studied under this heading.</li> <li>❖ 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.</li> <li>❖ The study of structures also provides a platform for introducing the means of wreckage trajectory analysis.</li> <li>❖ Every effort should be made to provide examples of the various failure modes in materials used in aircraft construction.</li> </ul>
	<p><b>Systems.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The wide variety of systems that the investigator should become familiar with in general terms.</li> <li>❖ 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.</li> <li>❖ A lead to system health can often be found in past maintenance records or on-board recorders.</li> <li>❖ It is necessary to discuss, in general terms, fuel, hydraulic, pneumatic, electrical, pressurization, flight control, instruments, navigation, autopilot and instrument systems.</li> <li>❖ Other topics that should be considered include software failures in airborne computers and the adequacy of the protection against catastrophic events ensuing from such failures.</li> </ul>
	<p><b>Aerodynamics.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ A review of basic aerodynamics and the means of detecting failure from aerodynamic factors should be included in the investigator's basic training.</li> <li>❖ The topics of engine failure recognition speed, <math>V_1</math> and <math>V_2</math>, climb gradient, over-speed, engine-out performance, icing and stability also deserve special attention.</li> </ul>
	<p><b>Power plants.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ Nevertheless, the explanation of the basic principles of reciprocating and turbine engines has a place in basic and advanced investigation courses.</li> </ul>



	<ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ For example, propellers and turbines can give a worthwhile indication of an absence of engine power at the time of impact.</li> <li>❖ This is another subject in which examples of failures and accident damage form an essential part of the course.</li> </ul>
	<p><b><i>Rotary wing aircraft.</i></b></p> <ul style="list-style-type: none"> <li>❖ A general introduction to the principles of flight for helicopters and their control systems is relevant.</li> <li>❖ However the subject of investigating helicopter and other rotary wing aircraft accidents is usually the subject of a separate specialty course.</li> </ul>
	<p><b><i>Organizational information.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The organizations include, for example, the operator; the air traffic services, airway, aerodrome and weather service agencies; and the regulatory authority.</li> <li>❖ 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 should be covered.</li> <li>❖ For example, an investigator should have the competence to review an aircraft operator’s management functions, policies and practices in their entirety.</li> <li>❖ 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 rostering; failure to provide proper training in aircraft type; shortcomings in crew resource management; and unreasonable pressure to complete schedules on time.</li> <li>❖ 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.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Human performance.</i></b></p> <ul style="list-style-type: none"> <li>❖ No accident investigation can be complete without a thorough consideration of Human Factors issues involved.</li> <li>❖ The demands of the environment and the aircraft on the human often approach the physiological and psychological limits of the flight crew, maintenance and</li> </ul>



	<p>servicing crews, air traffic services personnel and other personnel required to support aircraft operations.</p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ An examination of the handling of the aircraft will encompass the areas of operations and training.</li> <li>❖ 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.</li> </ul>
	<ul style="list-style-type: none"> <li>❖ The area of training will cover the extent and adequacy of the training relevant to the accident flight. The <i>Manual of Civil Aviation Medicine</i> (Doc 8984), the <i>Human Factors Training Manual</i> (Doc 9683), the <i>Human Factors Guidelines for Air Traffic Management (ATM) Systems</i> (Doc 9758) and the <i>Human Factors Guidelines for Safety Audits Manual</i> (Doc 9806) are references which can be used in this section of the training.</li> </ul>
	<p><b><i>Determination of the flight crew's suitability for the flight.</i></b></p> <ul style="list-style-type: none"> <li>❖ The flight crew members are required to meet certain licensing, training and experience requirements before conducting any flight.</li> <li>❖ In addition, they must be fit for their duty and the complement of the crew must be appropriate.</li> <li>❖ Familiarity with the flight crew documentation and requirements is essential. Fitness of the flight crew for the flight can be considered as part of several Human Factor considerations and should be explained in detail.</li> </ul>
	<p><b><i>Methods of analyzing the factual information gathered.</i></b></p> <ul style="list-style-type: none"> <li>❖ There are several structured procedures for analyzing the evidence and facts determined during the investigation.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Report writing.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ There is a minimum of duplication and a full consideration of aspects of the flight that are relevant to the improvement of safety.</li> </ul>



	<ul style="list-style-type: none"> <li>❖ Knowledge of this format and process gives the investigator a sound basis for drafting the final report, including the formulation of appropriate safety recommendations.</li> </ul>
	<p><b><i>The news media and public relations.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ There are two aspects to this subject: the information made available to the public, and the more specialized approach to the survivors and the families of those involved in an accident.</li> <li>❖ 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.</li> <li>❖ The <i>Guidance on Assistance to Aircraft Accident Victims and their Families</i> (Cir 285) is a sound basis for addressing this subject.</li> </ul>
<b>Prerequisites</b>	None
<b>Associated Training Course</b>	Fundamentals of Accident Investigation (Cranfield University); Aircraft Accident Investigation Course (USC/SCSI/SAA)
<b>Revision Date</b>	4 January 2022







## 4.3.2 OJT 2 (Following Basic Training)

4.3.2.1 During this phase, the aircraft accident investigators will practice the procedures and tasks covered in the basic training, and gain familiarity with initial actions at the accident site, such as security, hazards, safety precautions Wreckage Examination, the investigators' personal equipment and protective clothing, accident site safety, protection of evidence, wreckage diagramming, collection of evidence and control of access, witness marks, and other evidence, information gathering techniques and tools; examination of maintenance documents witness interview techniques

4.3.2.2 They will also be asked to contribute their opinions. All these OJT activities will be recorded on Form NSIB.04.03.

<b>Title</b>	<b>On-the-Job-Training (OJT) 2</b>
<b>Duration</b>	OJT sign off
<b>Objectives</b>	<p>On completion of this OJT participants will be able to:</p> <ul style="list-style-type: none"> <li>❖ Demonstrate knowledge of initial actions at the accident site such as control of access to and risk assessment of accident site</li> <li>❖ Demonstrate practical skills on using investigators personal equipment and PPE and collection of evidence</li> <li>❖ Demonstrate practical skills on use of camera</li> <li>❖ Demonstrate practical skills on examination of wreckage and plotting wreckage diagram</li> <li>❖ Organize logistics</li> <li>❖ Write Draft reports</li> </ul>
<b>Description</b>	<p>This course is designed for trainee aircraft accident investigators of the Bureau. It is aimed to expose new investigators to investigation tasks by attaching them to experienced investigators in new or on-going investigations.</p>



<b>Contents</b>	Attachment to participate in an on-going or new accident or serious incident investigation
<b>Prerequisites</b>	Completion of Basic Training
<b>Associated Training Course</b>	None
<b>Revision Date</b>	4 January 2022

## 4.4 ADVANCED TRAINING

This section contains the course contents for Advanced Formal classroom training and the OJT on the Advanced Training.

### 4.4.1 Advanced Formal Classroom Training

Most topics covered in the basic course will also apply to advanced courses, but the instructors are expected to vary their treatment of these topics to suit the purpose of the course and the experience level of the students. In addition to the review of the topics in the basic course, an advanced course is desirable for preparing an investigator for the responsibilities of group leader or investigator-in-charge of a major investigation.

Title	Advanced Training - <b>ONE-OFF TRAINING</b>
Duration	80 - 120 hours (10 - 15 Days)
Objectives	<p>On completion of the Advanced Training participants will have:</p> <ul style="list-style-type: none"> <li>❖ Gained knowledge on concepts and practical techniques on aircraft investigation methodology, and prepare an individual to participate in an aircraft accident investigation</li> <li>❖ Gained the skills needed to confidently conduct a major aircraft accident investigation.</li> </ul>
Description	This course follows on directly the Basic Training and concentrates on applying practical training, including simulation of an aircraft accident investigation.
Contents	In addition to the review of the organization of a major investigation, topics that should be considered include:

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	<ul style="list-style-type: none"> <li>• Management of complex investigations</li> <li>• Investigation of military aircraft accidents</li> <li>• Investigating operational accidents</li> <li>• Investigating technical accidents</li> <li>• Air Traffic Control investigations</li> <li>• Cabin safety investigations</li> <li>• Investigation of aircraft structural failures</li> <li>• Aircraft powerplant investigations</li> <li>• Investigating with recorded data</li> <li>• Investigating survivability</li> <li>• Impact and flight path assessment</li> <li>• Aviation operational and engineering human factors</li> <li>• Enhanced interview techniques</li> <li>• Applied analysis methods</li> <li>• Working with State-accredited representatives</li> <li>• Working with the regulator</li> <li>• A major manufacturer's perspective</li> <li>• Five-day accident simulation exercise</li> <li>• Working with the media</li> <li>• ICAO annex 13 report writing</li> <li>• Visit to UK AAIB and UK Defence AIB</li> <li>• State Director / Chief Inspector of Air Accidents' perspective</li> </ul> <ul style="list-style-type: none"> <li>❖ the provision of family assistance (briefings and distribution of investigation reports) to those involved in an accident;</li> <li>❖ relations with the media;</li> <li>❖ an introduction to methods for cataloguing a large number of fragments of wreckage;</li> <li>❖ methods for recovery of wreckage under water</li> <li>❖ management of a large accident site for security, safety and protection of the personnel;</li> <li>❖ preparation of briefings and answers to formal questions for members of government;</li> <li>❖ the methods of undertaking investigations that involve both civil and military aircraft; and</li> <li>❖ liaison with the law enforcement authorities in accidents involving unlawful interference. 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);</li> <li>❖ reconstruction of evidence recorded in damaged solid-state recorders;</li> <li>❖ the use of virtual video presentations in large structural reconstructions of wreckage; and</li> </ul>
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	<ul style="list-style-type: none"> <li>❖ 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.</li> </ul>
<b>Prerequisites</b>	Basic training
<b>Associated Training Course</b>	Applied Accident Investigation Course (Cranfield University; Aircraft Accident Investigation Course (USC/SCSI/SAA)
<b>Revision Date</b>	4 January 2022

## 4.4.2 OJT (Following Advanced Training)

4.4.2.1 After completing the Advanced Training, the Bureau will provide OJT for aircraft accident investigators. During this phase, the aircraft accident investigators will practice the procedures and tasks covered in the Advanced training, such as preparing an investigator for the responsibilities of group leader or investigator-in-charge of a major investigation, cataloguing a large number of fragments of wreckage, recovery of wreckage under water, management of a large accident site, reconstruction of evidence recorded in damaged solid state recorders, preparation of briefings and answers to formal questions and Report Writing.

4.4.2.2 All the JOT activities will be recorded on Form NSIB.04.03.

Title	<b>On-the-Job-Training (OJT) 3</b>
Duration	OJT Sign off
Objectives	On completion of this OJT participants will be able to: <ul style="list-style-type: none"> <li>❖ Demonstrate accident investigation leadership skills such as Group Leader or Investigator-In-Charge</li> <li>❖ Demonstrate practical skills on management of large scale accident site</li> <li>❖ Prepare media briefings</li> <li>❖ Write final report</li> </ul>

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Description	This course is designed for trainee aircraft accident investigators of the Bureau. It is aimed to expose investigators to investigation tasks by attaching them to foreign accident investigation authorities in new or on-going investigations.
Contents	Attachment to participate in an on-going or new accident investigation
Prerequisites	Advanced Training
Associated Training Course	None
Revision Date	4 January 2022





## 4.5 SIMULATIONS

Title	<b>Accident Site Training</b>	
Objectives	On completion of this training participants will be able to: <ul style="list-style-type: none"> <li>❖ Know different health and safety issues which they may face on accident site.</li> <li>❖ Know how to produce an investigation plan for on-site phase.</li> <li>❖ Understand their role as part of the investigation team.</li> <li>❖ Know the value of good documentation; different techniques and possibilities</li> <li>❖ Know how to use investigation equipment (measuring tools, cameras etc.)</li> </ul>	
Materials and methods	<ul style="list-style-type: none"> <li>❖ Notes, pens</li> <li>❖ Risk assessment checklist</li> <li>❖ Personal investigation equipment</li> <li>❖ Investigation kit</li> <li>❖ Camera for each participant</li> </ul>	
<b>Classroom lectures and discussions</b>		
<b>Duration</b>	<b>Topic</b>	<b>Learning Method</b>
<b>30 Minutes</b>	<b>Introduction</b> <ul style="list-style-type: none"> <li>❖ Objectives of training</li> <li>❖ Introduction of participants</li> <li>❖ Schedule for the course</li> </ul>	Classroom Lectures
<b>2 Hours</b>	<b>Health and Safety</b> <ul style="list-style-type: none"> <li>❖ Hazards on accident site, risk assessment checklist</li> <li>❖ Protective Equipment</li> </ul>	<ul style="list-style-type: none"> <li>❖ Lecture</li> <li>❖ Discussions</li> </ul>
<b>2 Hours</b>	<b>Producing an investigation plan for accident site</b> <ul style="list-style-type: none"> <li>❖ Checklist</li> <li>❖ Available resources</li> <li>❖ Assignment of responsibilities</li> <li>❖ Role of the Team leader</li> <li>❖ Timeline</li> <li>❖ Interviewing witnesses</li> <li>❖ Communication: situational awareness inside the Bureau</li> <li>❖ Recovery of the wreckage</li> </ul>	<ul style="list-style-type: none"> <li>❖ Lecture</li> <li>❖ Discussions</li> </ul>
<b>2 hours</b>	<b>Documentation of accident site</b>	<ul style="list-style-type: none"> <li>❖ Lecture</li> </ul>



	<ul style="list-style-type: none"> <li>❖ Personal Investigator's Equipment</li> <li>❖ Photography; basic principles for good photos, lighting options</li> <li>❖ Systematic way of documenting</li> <li>❖ Other documentation tools</li> </ul>	<ul style="list-style-type: none"> <li>❖ Practice setting up the camera and lights</li> <li>❖ Other available tools</li> </ul>
<b>45 Minutes</b>	<b>Briefing for the next day</b> <ul style="list-style-type: none"> <li>❖ Objectives</li> <li>❖ Forming working groups</li> </ul>	Briefing by instructor
<b>Practical Exercise with the wreckage</b>		
<b>1 Hour</b>	<b>Initial actions on accident site:</b> <ul style="list-style-type: none"> <li>❖ Communication with other authorities</li> <li>❖ Production of investigation plan</li> <li>❖ Risk assessment</li> </ul>	Participants work in small groups
<b>2 Hours</b>	<b>Documenting the accident site</b> <ul style="list-style-type: none"> <li>❖ Systematic approach</li> <li>❖ Sharing responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>❖ Group work led by Team leader</li> <li>❖ Participants use their cameras and lights</li> </ul>
<b>2 Hours</b>	<b>Examination of the wreckage</b> <ul style="list-style-type: none"> <li>❖ Measuring marks on pieces on the ground</li> <li>❖ Setting priorities</li> </ul>	Group work led by Team leader
<b>Revision Date</b>	4 January 2022	

## 4.6 SAFETY TRAINING PROGRAM

This section contains the course contents for State Safety Program (SSP) and Safety Management System (SMS) Formal classroom training for the following categories of staff:

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- a) Briefings or familiarization training on SSP & SMS for senior management staff; and
- b) SSP and SMS training for air safety investigators

<b>Title</b>	Briefings/Familiarization on SSP & SMS for Senior Management
<b>Duration</b>	16 - 32 hours (2 - 4 Days)
<b>Objectives</b>	On completion of the Familiarization SSP/SMS Training participants will be able to: ❖
<b>Description</b>	This course is designed for Senior Management staff of the Bureau, who gives direction, allocates resources and supervises of the affairs of the Bureau, including aircraft accident investigation activities and need to understand basic SSP/SMS policies, principles and objectives, etc. The course focuses on the safety policies, the fundamentals of SSP/SMS implementation.
<b>Contents</b>	<p><b>General introduction.</b></p> <ul style="list-style-type: none"> <li>❖ The history of aircraft accident investigation</li> <li>❖ the development of the international agreements on the conduct of investigations,</li> <li>❖ The Standards and Recommended Practices (SARPs) adopted by ICAO and its Contracting States in the field of aircraft accident investigation.</li> <li>❖ The responsibilities of the States involved, as defined in Annex 13 — <i>Aircraft Accident and Incident Investigation</i></li> <li>❖ The applicable international agreements and SARPs are contained in Annex 13 — <i>Aircraft Accident and Incident Investigation</i> to the Convention on International Civil Aviation. Relevant guidance material is provided in the <i>Manual of Aircraft Accident Investigation</i> (Doc 6920) and <i>Manual of Aircraft Accident and Incident Investigation</i> (Doc 9756). A review of these documents and their salient points is required so that the investigator knows where to find the information on the relevant topics. General guidance should also be given on the investigation of accidents involving unlawful interference, both civil and military aircraft or facilities, and inaccessible or missing aircraft.</li> </ul> <p><b>Accident notification procedures.</b></p>





	<ul style="list-style-type: none"> <li>❖ The accident notification systems and the appropriate responses to be expected from each State and organization that are notified.</li> <li>❖ The ways on how the notification of the occurrence of an accident initiates the process of an investigation.</li> <li>❖ 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.</li> <li>❖ The requirements of Annex 13 in relation to this phase of an investigation.</li> <li>❖ Preparation for overseas travel in the form of passports and visas and airport airside passes should be reviewed, as should the benefits of access provided by the international agreements inherent in Annex 9 — <i>Facilitation</i>.</li> </ul>
	<p><b><i>Investigation management.</i></b></p> <ul style="list-style-type: none"> <li>❖ The role of the investigator, the skills he will need to acquire, and the accident investigation process.</li> <li>❖ The value of assessing the availability of resources (such as funding, personnel, equipment and buildings)</li> <li>❖ The planning for the investigation of a major accident beforehand.</li> <li>❖ 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.</li> <li>❖ An appreciation of the realities of the limits imposed by the resources available and the optimum use of those resources.</li> <li>❖ The value of memoranda of understanding with departments and organizations that might be involved in an investigation.</li> </ul>
	<p><b><i>Investigators' equipment.</i></b></p> <ul style="list-style-type: none"> <li>❖ The factors determining the equipment to be used during investigations (availability, cost and the means available to transport it to the site.</li> <li>❖ The use of contemporary aids such as global positioning systems (GPS), satellite telephones, and data links back to base, as well as on the use of basic items such as compasses and inclinometers.</li> <li>❖ Means of recording in extreme wet or cold conditions.</li> <li>❖ The proper method of taking samples of aircraft fluids and the appropriate containers should also be included.</li> </ul>
	<p><b><i>Accident site safety.</i></b></p> <ul style="list-style-type: none"> <li>❖ The safety of personnel at an aircraft accident site.</li> <li>❖ The appropriate measures to protect those on the site against exposure to the elements, to any hazardous cargo or dangerous materials released from the</li> </ul>



	<p>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.</p> <ul style="list-style-type: none"> <li>❖ The 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.</li> <li>❖ Demonstrating the use of protective equipment against airborne and blood borne pathogens.</li> <li>❖ Special consideration on utilities such as gas mains, electricity transmission lines and main transport routes.</li> <li>❖ A plan for aid and rescue in the event of an accident involving personnel at the site (requirements by many occupational health and safety organizations).</li> </ul>
	<p><b><i>Protection of evidence.</i></b></p> <ul style="list-style-type: none"> <li>❖ To establish a suitable environment for a competent examination of the area and the accident debris, measures should be taken to protect the wreckage from fires, meteorological hazards and souveniring.</li> <li>❖ The need to give priority to recording transient evidence, securing light objects that may be lost in the wind, and recording ground scars and other site markings that may become obliterated should be addressed.</li> <li>❖ The conduct of interviews with the rescue personnel should also be discussed in order to facilitate the determination of the movement of items of wreckage, which they may have caused inadvertently.</li> </ul>
	<p><b><i>Initial action at the accident site.</i></b></p> <ul style="list-style-type: none"> <li>❖ The investigator should 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.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Information gathering techniques.</i></b></p> <ul style="list-style-type: none"> <li>❖ The investigator under training should be introduced to the methods of gathering and reviewing relevant documentation and procedures;</li> <li>❖ The interview techniques used for different types of witnesses; the transcription of air traffic services and other recordings; and</li> <li>❖ The review of aerodrome facilities, emergency services responses and meteorological data.</li> </ul>
	<p><b><i>Communication and recording media.</i></b></p>



<b>Contents</b>	<ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ Digital video cameras and digital cameras, standard film photography, laptops and hand-held computers with connections via satellite 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.</li> <li>❖ As each type of equipment is evolving rapidly, it is an essential subject in the training of an investigator.</li> </ul>
	<p><b><i>Witness interviews.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ They may be a visual witness who saw an event or an aural witness who heard a sound or relevant conversation.</li> <li>❖ 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 must be considered.</li> <li>❖ 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 should be discussed.</li> </ul>
	<p><b><i>Recorders.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The value of each form of recorder, the methods of interpreting and downloading the information, and the sources of readout must be in the course syllabus.</li> <li>❖ 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) should be explored.</li> <li>❖ Another aspect of importance is the means of locating the flight recorders and recovering them from locations that are difficult to reach.</li> <li>❖ Recorders at air traffic services facilities, particularly those that record radar returns, should be the subject of a separate study and guidance regarding their potential use to an investigation.</li> </ul>



	<p><b><i>Examination of relevant maintenance documents.</i></b></p> <ul style="list-style-type: none"> <li>❖ The maintenance history of the aircraft is established primarily from the records held by the operator.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Fires and explosions.</i></b></p> <ul style="list-style-type: none"> <li>❖ The evidence available to distinguish an in-flight fire or explosion from post-accident fires forms a valuable lesson that must be passed on to the new investigator.</li> <li>❖ The means of determining the ignition source and the fuel supply of a fire are important.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Survival aspects.</i></b></p> <ul style="list-style-type: none"> <li>❖ The chances of occupants surviving an accident can be assessed and the means to do so should be given to the accident investigator.</li> <li>❖ The investigator should know the formulae for impact force calculations and the various forms of attenuating impact forces.</li> <li>❖ 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.</li> <li>❖ 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 are items that should be studied under this heading.</li> <li>❖ It is also very important to review the factors that affect the occupants' chances of surviving the accident.</li> <li>❖ The means of determining the after effects of a fire on the occupants and the fire's impediment to passenger evacuation must be discussed, as must the availability of such items as smoke hoods and smoke goggles.</li> <li>❖ 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.</li> <li>❖ 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.</li> </ul>
	<p><b><i>Structures.</i></b></p> <ul style="list-style-type: none"> <li>❖ As the basis for the examination of the wreckage, the study of structures is an area of prime interest to the investigator.</li> <li>❖ The study of structures should comprise metallurgy, fiber reinforced plastics and timber structures, stress analysis and the strength of these materials. It should</li> </ul>



	<p>also include the various modes of failure and the characteristics of such failures in the materials used in aircraft structures.</p> <ul style="list-style-type: none"> <li>❖ 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.</li> </ul>
	<ul style="list-style-type: none"> <li>❖ The various types of flight controls and landing gear structures should also be studied under this heading.</li> <li>❖ 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.</li> <li>❖ The study of structures also provides a platform for introducing the means of wreckage trajectory analysis.</li> <li>❖ Every effort should be made to provide examples of the various failure modes in materials used in aircraft construction.</li> </ul>
	<p><b>Systems.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The wide variety of systems that the investigator should become familiar with in general terms.</li> <li>❖ 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.</li> <li>❖ A lead to system health can often be found in past maintenance records or on-board recorders.</li> <li>❖ It is necessary to discuss, in general terms, fuel, hydraulic, pneumatic, electrical, pressurization, flight control, instruments, navigation, autopilot and instrument systems.</li> <li>❖ Other topics that should be considered include software failures in airborne computers and the adequacy of the protection against catastrophic events ensuing from such failures.</li> </ul>
	<p><b>Aerodynamics.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ A review of basic aerodynamics and the means of detecting failure from aerodynamic factors should be included in the investigator's basic training.</li> <li>❖ The topics of engine failure recognition speed, <math>V_1</math> and <math>V_2</math>, climb gradient, over-speed, engine-out performance, icing and stability also deserve special attention.</li> </ul>



	<p><b>Power plants.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ Nevertheless, the explanation of the basic principles of reciprocating and turbine engines has a place in basic and advanced investigation courses.</li> <li>❖ 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.</li> <li>❖ For example, propellers and turbines can give a worthwhile indication of an absence of engine power at the time of impact.</li> <li>❖ This is another subject in which examples of failures and accident damage form an essential part of the course.</li> </ul>
	<p><b>Rotary wing aircraft.</b></p> <ul style="list-style-type: none"> <li>❖ A general introduction to the principles of flight for helicopters and their control systems is relevant.</li> <li>❖ However the subject of investigating helicopter and other rotary wing aircraft accidents is usually the subject of a separate specialty course.</li> </ul>
	<p><b>Organizational information.</b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ The organizations include, for example, the operator; the air traffic services, airway, aerodrome and weather service agencies; and the regulatory authority.</li> <li>❖ 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 should be covered.</li> <li>❖ For example, an investigator should have the competence to review an aircraft operator's management functions, policies and practices in their entirety.</li> <li>❖ 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 rostering; failure to provide proper training in aircraft type; shortcomings in crew resource management; and unreasonable pressure to complete schedules on time.</li> <li>❖ 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.</li> <li>❖ 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.</li> </ul>



	<p><b>Human performance.</b></p> <ul style="list-style-type: none"> <li>❖ No accident investigation can be complete without a thorough consideration of Human Factors issues involved.</li> <li>❖ 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.</li> <li>❖ 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.</li> <li>❖ An examination of the handling of the aircraft will encompass the areas of operations and training.</li> <li>❖ 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, analysed and attempted to cope with the complexities of the flight.</li> </ul> <p>❖ The area of training will cover the extent and adequacy of the training relevant to the accident flight. The <i>Manual of Civil Aviation Medicine</i> (Doc 8984), the <i>Human Factors Training Manual</i> (Doc 9683), the <i>Human Factors Guidelines for Air Traffic Management (ATM) Systems</i> (Doc 9758) and the <i>Human Factors Guidelines for Safety Audits Manual</i> (Doc 9806) are references which can be used in this section of the training.</p> <p><b>Determination of the flight crew's suitability for the flight.</b></p> <ul style="list-style-type: none"> <li>❖ The flight crew members are required to meet certain licensing, training and experience requirements before conducting any flight.</li> <li>❖ In addition, they must be fit for their duty and the complement of the crew must be appropriate.</li> <li>❖ Familiarity with the flight crew documentation and requirements is essential. Fitness of the flight crew for the flight can be considered as part of several Human Factor considerations and should be explained in detail.</li> </ul> <p><b>Methods of analyzing the factual information gathered.</b></p> <ul style="list-style-type: none"> <li>❖ There are several structured procedures for analyzing the evidence and facts determined during the investigation.</li> <li>❖ 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.</li> </ul> <p><b>Report writing.</b></p>
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	<ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ There is a minimum of duplication and a full consideration of aspects of the flight that are relevant to the improvement of safety.</li> <li>❖ Knowledge of this format and process gives the investigator a sound basis for drafting the final report, including the formulation of appropriate safety recommendations.</li> </ul>
	<p><b><i>The news media and public relations.</i></b></p> <ul style="list-style-type: none"> <li>❖ 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.</li> <li>❖ There are two aspects to this subject: the information made available to the public, and the more specialized approach to the survivors and the families of those involved in an accident.</li> <li>❖ 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.</li> <li>❖ The <i>Guidance on Assistance to Aircraft Accident Victims and their Families</i> (Cir 285) is a sound basis for addressing this subject.</li> </ul>
<b>Prerequisites</b>	None
<b>Associated Training Course</b>	Fundamentals of Accident Investigation (Cranfield University); Aircraft Accident Investigation Course (USC/SCSI/SAA)
<b>Revision Date</b>	4 January 2022





## CHAPTER 5 APPENDICES

### Appendix I: MANUAL CHANGE REQUEST FORM

## ACCIDENT INVESTIGATION BUREAU

SAFETY HOUSE, MURTALA MUHAMMED INTERNATIONAL AIRPORT P.M.B. 016 KEJA-LAGOS, NIGERIA



MANUAL CHANGE REQUEST FORM			
CHANGE ORIGINATOR USE			
Manual Title:			
Section:	Page:	Paragraph:	Revision:
The Requested Change:			
<input type="checkbox"/> Additional information attached			
Reason(s) for the Change:			
<input type="checkbox"/> Additional information attached			
Originator Name & Sign.:			Date:
MANUAL APPROVAL AUTHORITY USE			
Departments Consulted Regarding the Change		Sign. & Date	
Human Resource			
Legal			
Security and Safety			
ICT			
Director of Engineering			
Director of Operations			
Commissioner/CEO			
Department Comments upon Review			
<input type="checkbox"/> DECLINED - Reason Provided			
<input type="checkbox"/> APPROVED			
Approval Authority Signature:			Date:
Change Incorporated in Revision Number:			Date:

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## Appendix II: Individual Development Plan

NSIB TRAINING PROGRAM									
			<small>Not Applicable</small> <small>Applicable</small> <span style="color: green;">■</span> <small>Not Applicable</small> <span style="color: yellow;">■</span>						
Investigations					Engineering	Operations			
No.	Programme Type/Phase	Course Title							
1	Initial	Indoctrination							
2	Initial	Investigation Initial Training							
3	OJT	OJT 1 (Following Initial Training)							
4	Basic	Fundamental of Accident Investigation							
5	OJT	OJT 2 (Following Basic Training)							
6	Advance	Applied Accident Investigation (Application of fundamentals)							
7	OJT	OJT 3 (Following Advance Training)							
8	Additional	Investigation Management							
9	Specialisation	Airframe & Power plant (As applicable)							
10	Specialisation	Avionics (As applicable)							
11	Specialisation	PPL (As applicable)							
12	Specialisation	CPL (As applicable)							
13	Specialisation	ATC (As applicable)							
14	Specialisation	Flight Dispatch (As applicable)							
15	Specialisation	Cabin Crew Training ( As applicable)							
16	Specialisation	Gas Turbine Accident Investigation							
17	Specialisation	Helicopter Accident Investigation							
18	Specialisation	Human Factors investigation							
19	Specialisation	safety management systems							
20	Specialisation	family assistance and media relations							
21	Specialisation	Air Traffic Investigation & Analyses							
22	Specialisation	Unmanned Aircraft Systems							
23	Specialisation	Accident survival aspects							
24	Specialisation	flight data analysis							
25	Specialisation	fires and explosions							
26	Specialisation	Aircraft Type courses							
27	Specialisation	Train the Trainer							
28	Recurrent	Aviation Legislation-Laws & Regulations							
29	Recurrent	Investigation Policy & Procedures Manual							
30	Recurrent	State Safety Program/ Safety Management System							
31	Recurrent	Human Factors							
32	Recurrent	Flight Data Analysis							
33	Recurrent	Dangerous Goods Awareness							
34	Recurrent	Site hazard and risk management							
35	Recurrent	Accident site drill							
36	Recurrent	Table top exercises							



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## Appendix III: OJT Progress Chart

### ACCIDENT INVESTIGATION BUREAU



SEKUTUP HIMPUNAN MELAKSAKANDU BERKUALITI BERSEKUTU MERAUTU KEJARAAN TERKINI, MALAYSIA

Aircraft Accident Investigator OJT Progress Chart						
Name:						
Department:						
Grade Level or Position:						
Supervisor:						
OJT Job Task	Source/ Course	OJT Performance Assessment				
		Level I Observe	Level II Observe/ Assist	Level III Perform	Confirmed By:	Sign. & Date
Review Annex 13 and Doc 7834	Initial/Basic					
Notification Procedures	Initial/Basic					
Collection of factual information (Documenting evidence, witness interview, transcription of CVR recording)	Initial/Basic					
Analysis	Initial/Basic					
Writing draft Final Report	Initial/Basic					
Use of investigation equipment (GPS, Camera)	Initial/Basic					
Attachment to participate in an ongoing or new small aircraft accident investigation	Basic					
Attachment to participate in an ongoing or new serious incident or small aircraft investigation	Basic					
Attachment to participate in an ongoing or new major aircraft accident investigation	Advanced					
Attachment to participate in an ongoing or new major aircraft accident investigation	Advanced					
Level I Validation (see cover page for guide)						
Level II Validation (see cover page for guide)						
Level III Validation (see cover page for guide)						

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## ACCIDENT INVESTIGATION BUREAU

SULIT HOUSE, MONTAJA ROAD, ANGEDINI, NATIONAL AIRPORT, P.O. BOX 508 KUALA LUMPUR, NEGARA



### General guidelines for conducting the OJT:

Level	Trainee	Instructor
Level I - Knowledge	Study	Discuss
Level II - Understanding	Observe	Demonstrate
Level III - Performance	Perform	Evaluate

At the end of each training session the instructor will validate that the trainee has successfully completed that session and the training objectives were met before notifying the Training Coordinator that training is complete.

**NOTE:** Levels I may be selected if the trainee had earlier attended formal classroom or computer-based training.

### Level I validation guide:

Level I is typically a self-study effort on the part of the trainee with guided discussion and validation conducted by the OJT instructor afterwards.

### Level II validation guide:

Level II involves the actual performance of the task. The instructor demonstrates how the task is performed while the trainee observes.

1. Review technical requirements
2. Assess the trainee's existing knowledge and skill in performing the task
3. Demonstrate task
4. Monitor the trainee

### Level III validation guide:

1. Review technical requirements
2. Assess the trainee's existing knowledge and skill in performing the task
3. Observe the trainee perform the task
4. Allow sufficient time for the trainee to practice task
5. Ask questions to check for understanding
6. Provide explanations
7. Review and summarize information
8. Provide feedback and evaluate the trainee's performance
9. Provide additional training when necessary

To Validate Level III OJT, the instructor, must be able to answer "Yes" to all of the questions shown below.

	Yes	No
Did the trainee demonstrate sufficient knowledge to accurately complete the task?		
Did the trainee demonstrate all steps necessary to proficiently complete the task?		
Were the steps completed in the proper order?		
Did the trainee perform the task in a timely manner and without assistance?		

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