



CHAPTER 16

CONDUCT OF AN ACCIDENT INVESTIGATION

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1.0 DEFINITION

1.1 AIRCRAFTACCIDENT:

An occurrence associated with the operation of an aircraft that:

- * Takes place between the time the first person boards the aircraft with the intention of flight and the last person has disembarked.
- * Results in death or serious injury.
- * Causes substantial damage to the aircraft.

1.2 AIRCRAFTINCIDENT:

An occurrence, other than an accident, associated with the operation of an aircraft that affects or could affect the safety of operations.

1.3 SERIOUSINJURY:

An injury that:

- * Requires hospitalization for more than 48 hours, within 7 days from the date an injury was received.
- * Results in a fracture of any bone (except simple fractures of fingers, toes, or nose).
- * Causes severe hemorrhages, and/or nerve, muscle, or tendon damage.
- * Involves second or third degree burns, or burns affecting more than 5 percent of the body surface.
- * Involves damage to any internal organ.



1.4 SUBSTANTIAL DAMAGE:

Damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and that would normally require major repair or replacement of the affected component.

- (a) For the purpose of this task, exceptions to this definition includes:
- * Engine failure or damage limited to an engine.
 - * Bent fairings or cowling.
 - * Dented skin or small puncture holes in the skin or fabric.
 - * Ground damage to rotor or propeller blades.
 - * Damage to landing gear, wheels, brakes, tires, flaps, engine accessories, or wingtips.
- (b) Aviation Safety Inspectors are urged to fully consider all aspects of these exceptions before making a final “substantial damage” determination that would classify the occurrence as an incident.

2.0 GENERAL

- 2.1 The primary responsibility of Accident Investigation rests the Accident Investigation Bureau(AIB)
- 2.2 This Order provides general guidance for conducting an accident investigation. NCAA Inspector involvement in accident investigation is basically as members, experts and or loan staff to the team of Accident Investigation Bureau (AIB) investigators.
- 2.3 The Accident Investigation Bureau (AIB) investigator in charge of the investigation is responsible for making a determination of NCAA involvement and will include this in the notification to the NCAA.



2.4 The NCAA compliance and enforcement programme promotes aviation safety and protects the public interest by seeking compliance with the regulatory requirements through the use of:

- * Education.
- * Surveillance.
- * Enforcement.

2.5 NCAA actions, from investigation to disposition, must ensure fair and equal treatment for all involved individuals. This requires NCAA employees to approach work objectively and pursue each step of the process without delay.

2.6 Pre-Accident Plan

The NCAA Office should have a pre-accident plan that is tailored to the specific requirement (e.g., geographic location, climate, staffing, resources, etc.). The success of an accident investigation often depends on how well the pre-accident plan is kept current, rehearsed, and carried out.

3.0 RESPONSIBILITIES

3.1 NCAA Responsibilities

NCAA accident investigation responsibilities include the following:

- (1) Ensuring that:
 - * All facts and circumstances leading to the accident are recorded and evaluated.
 - * Actions are taken to prevent similar accidents in the future.



(2) Determining if:

- * There was a violation of the Civil Aviation (Air Navigation) Regulations.
- * The performance of NCAA facilities or functions was a factor.
- * The airworthiness of aircraft was a factor.
- * The competency of NCAA certificated airmen, air agencies, operators, or an airport was a factor.
- * The Civil Aviation (Air Navigation) Regulations were adequate.
- * The airport certification safety standards or operations were involved.
- * The operator/airport security standards or operations were involved.
- * Airmen medical qualifications were involved.

3.2 The NCAA is obligated to supply all resources essential to producing aircraft accident reports, e.g., manpower, travel, inspection, testing, wreckage recovery, security guards, etc. and order such services and commit the funds for these activities.

3.3. The authority to conduct autopsies and tests of the remains of persons aboard the aircraft at the time of the accident may be delegated by the Director General to a medically qualified official or medically qualified employee of the NCAA in agreement with AIB. Designated aviation medical examiners are not deemed to be officials or employees for this purpose.

3.4. NCAA Investigator-In-Charge's Responsibilities.

The NCAA shall at all times have an Investigator-In-Charge designated as its principal representative. The designation of Investigator-In-Charge constitutes that person's authority to procure and utilize the services of all needed NCAA personnel, facilities, equipment, and records.

- (1) *General responsibilities.* The NCAA Investigator-In-Charge directs and controls all NCAA participation in the investigation until the accident investigation is complete. During the assignment as NCAA Investigator- In- Charge responsibility is direct to the Chairman, Flight Standard Group



3.5 NCAA Participant Responsibilities

- (1) Participants are responsible to the Investigator-In-Charge in all matters related to the investigation, to include obtaining consent before:
 - * Withdrawing from the investigation.
 - * Submitting requested reports.
 - * Supplying information or reports to any person outside their assigned group.
- (2) Personnel representing the NCAA organizational element authorized access to the accident scene are subject to the requirements of the above paragraph. These personnel shall provide the Investigator-In-Charge with reproducible copies of all reports that they have prepared or received during the investigation.
- (3) NCAA personnel not specifically assigned as participants or support personnel are not permitted at the scene of an accident without the knowledge and consent of the Investigator-In-Charge.

4.0 TYPES OF AIRCRAFT ACCIDENT INVESTIGATIONS

4.1 Military Accident Investigations

- (1) A “function of the NCAA” is defined as involvement of:
 - * An NCAA employee or designee.
 - * An NCAA facility.
 - * NCAA procedures, directives, or publications.
 - * A NCAA certificated civilian airman.
 - * A NCAA certificated joint use airport.
 - * An aircraft and/or equipment common to both civil and military aviation.
 - * Common interest environmental factors.



- (2) The military commander in charge of the investigation is responsible for making a determination of NCAA involvement and will include this in the notification to the NCAA.
- (3) In a military aircraft (mishap) in which a mutual interest exists but no NCAA function is or may be involved, the NCAA can request to participate in the investigation. Requests for participation shall be forwarded to the appropriate military safety center, following coordination with the NCAA Director General.

4.2 Agricultural Aircraft Accident Investigation

- (1) The Investigator-In-Charge should use extreme caution when arriving at an accident site in which an agricultural aircraft is involved, as the site may be contaminated with hazardous chemicals or “economic poisons.” If this is the case, protective clothing or other appropriate cautions may be required during the investigation.
- (2) If there is any question as to what type of substance is on board the aircraft, the Investigator-in-Charge should make every attempt to contract the operator to identify the substance and determine whether there are any associated risks before allowing anyone on the site.

4.3 Foreign Accidents

- (1) When Nigerian aircraft are involved in an accident/incident in a foreign country, they will be investigated by the AIB in agreement with Local Authority in charge of accident investigation in the country where the accident occurred.
- (2) When foreign-registered aircraft are involved in an accident/incident in Nigeria that accident/incident will be handled the same way as a Nigerian civil aircraft accident/incident investigation.



5.0 POST-NOTIFICATION ACTIVITIES

5.1 Investigation Delegates

Certain steps have to be taken to initiate NCAA involvement in accident investigations. The facilities of an Airport Control Centre (ACC), where one exists, may be used to establish the necessary contacts and coordination with the following:

- (1) Law enforcement or airport authorities for:
 - * Wreckage and site security.
 - * Information on accessibility of the accident site and environmental conditions.
 - * Arrangements for local travel to the site, etc.
- (2) Coroner or nearest Aviation Medical Examiner (AME), for arrangements for proper autopsies and toxicological tests, etc.
- (3) Manufacturer, operator, or owner for specific assistance, such as documents, certificates, data, etc.
- (4) Air Traffic Centre, and tower facilities for:
 - * Preliminary information on flight plan and pilot's intent.
 - * Radio communications.
 - * Flight progress report, etc.
- (5) Weather Service, or certified observers for relevant weather information.

5.2 Office Coordination

- (1) Coordination will be necessary to ensure that response time to an accident investigation is as brief as possible.



- (2) Coordination should be established to give AIB the name of the Investigator-In-Charge and the expected time of arrival. Before departing, the Investigator-In-Charge should designate an initial contact point to which messages can be sent during the transient status.

5.3 Investigation Equipment

The diversity of aircraft accidents makes it difficult to have all the necessary equipment available. Certain items commonly used in every investigation should be kept in readiness. The NCAA Office must develop its own requirement.

5.4 Safety at the accident site

This is an area of vital importance and needs to be addressed by the Investigator-In-Charge when planning the investigation. Aspects to be considered include both inspector and bystander safety.

- (1) Some items to be considered by the Investigator-In-Charge include the following:
 - * Shifting wreckage on steep slopes.
 - * Pressurized systems and components, including hydraulic, pneumatic, and oxygen systems.
 - * Blowout (explosion) of damaged landing garters.
 - * Ejection seat cartridges in military or ex-military aircraft.
 - * Loaded weapons, such as when law enforcement agencies or hunters were known to be aboard.
 - * Electrically charged wreckage.
 - * Reactions of toxic agents present in afire.
 - * Hazardous agricultural chemicals.



- (2) Some actions to be considered by the Investigator-In-Charge include the following:
- * Wearing gloves when handling wreckage and using hard hats when working inside or under wreckage.
 - * Delaying the handling of wreckage if there is any reason to suspect the presence of hazardous cargo, including radioactive materials or chemicals, until the necessary checks have been made and the site has been declared safe
 - * Taking into account the advice of local experts such as law enforcement personnel as to the type of protection and precautions needed in certain terrain.
 - * Providing for first aid, shelter, food, water, and fuel due to unexpected weather or equipment failures that may isolate the investigation team in remote areas.
 - * Setting up a communications system for logging-in and logging-out of personnel operating in remote areas.
 - * Controlling access to the site to ensure bystander safety.

5.5 Accident Site Preservation

Preservation of the accident site is of primary importance to a successful accident investigation. Removal of survivors and victims', fire fighting, and removal of hazardous materials can damage the accident site, but may be necessary prior to the start of the investigation. The Investigation- In-Charge is responsible for securing the site to ensure preservation.

5.6 Rotorcraft Wreckage Considerations

The Investigator-In-Charge should be aware that the investigation of a rotorcraft accident may present problems that would not be encountered in an airplane accident investigation. When the Investigator-In-Charge is not thoroughly familiar with rotorcraft engineering and aerodynamics, assistance should be requested. Some unique considerations include the following:



- (1) Rotating components that separate in-flight may produce unpredictable scatter patterns, while the heavy items in single rotor rotorcrafts tend to be clustered together around and beneath the mast.
- (2) In general, a rotorcraft is very intolerant of mechanical and maintenance deficiencies and operations outside of its performance envelope.

5.7 Witness Statements

- (1) If a violation is suspected there are additional requirements for the handling of witness statements. These requirements include the following:
 - * If witnesses object to a copy of their statement being used, they must be informed that they may be subpoenaed if enforcement action is taken.

5.8 On site Survey

During the time spent at the accident site there should be a continual gathering of facts by all involved inspectors. The Investigator-In-Charge should be continually evaluating this evidence for possible consideration as a contributing factor.

- (1) Some evidence to be considered includes the following:
 - * Missing extremities such as wing or stabilizer tips, vertical stabilizer tip, and propeller or rotor tips.
 - * Missing flight control surfaces such as rudder, elevators, ailerons, flaps, stabilizers, spoilers, slats, tabs.
 - * Missing structure.
 - * Pre-impact versus post-crash fire evidence.
 - * Metal fatigue versus instantaneous breaks.
 - * In-flight versus impact breaks
 - * Positive versus negative-forces.
 - * Overloading or out of centre-of -gravity evidence.



- * Evidence of aircraft attitude at impact.
- * Controlled versus uncontrolled attitude at impact.
- * Engine power at impact.
- * Systems operation prior to impact.
- * Evidence of G-force at impact.
- * Post-crash flight control positions.
- * Cockpit documentation.
- * Evidence of impact prior to final terrain contact, such as damage to trees, wires, buildings, terrain, poles, or obstructions.
- * Witness statements.
- * Fuel contamination or exhaustion

2) Accident probable cause statistics show that a high percentage of accidents are caused by human error. Therefore the Investigator-In-Charge must consider other elements that could have contributed to the cause of the accident. The following is a partial list of areas of consideration:

- * Possible fatigue factors.
- * Crew qualifications.
- * Medical factors.
- * Peer group pressures.
- * Over extension of capabilities.
- * Drug and/or alcohol usage.



6.0 POST ON-SITE INVESTIGATION ACTIVITIES.

The Investigator-In-Charge's responsibilities do not end with the conclusion of the on-site investigation. Some of the activities necessary after completion of the on-site investigation might include:

- * Testing and teardown of aircraft components and parts in accordance with the manufacturer's manuals.
- * Comparing the aircraft's certificated performance with the performance under the conditions existing at the time of the accident. Simulator or actual flight tests may be required.
- * Reviewing all relevant certification standards (aircraft, airmen, operators, airport facilities, schools, repair stations, etc.) for factors that may have contributed to the accident.
- * Documenting the pilots flying background, experience, training, medical history, and certification.
- * Documenting the pilot's preparation and execution of the flight. This could entail contacting the Tower and Air Traffic Centre facilities involved, and obtaining final transcripts of all recorded communication, as required.
- * Documenting all pertinent weather data, such as pilot briefings, forecast weather, actual weather, PIREP's, SIGMET's etc.
- * Submitting safety proposals in the form of accident prevention recommendations.

7.0 VIOLATIONS

If, at any time during the investigation, facts are revealed that indicate a violation of the Civil Aviation (Air Navigation) the Investigator-In-Charger should notify the Chairman, Flight Standard Group and the Director General.



8.0 DOWNGRADING AN ACCIDENT TO AN INCIDENT.

If a determination is made that the incident should be downgraded to incident status, the AIB Investigator-In-Charge will:

- * Coordinate with the NCAA Representatives for a joint agreement on this decision.
- * The AIB will formally in writing hand over the investigation to NCAA for further investigation.
- * Follow the procedures outlined in, Conduct of an Incident Investigation.

9.0 ACCIDENT INVESTIGATION RECORDS DISPOSAL.

Accident investigation records shall be retained in the Flight Standard Group Office for a minimum of five (5) years.

10. PREREQUISITES AND COORDINATION REQUIREMENTS.

10.1 Prerequisites

- * Knowledge of the regulatory requirements of the Nigeria Civil Aviation Regulations.
- * Successful completion of an Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent.
- * Successful completion of Aircraft Accident Investigation Course and or other relevant courses/ experience necessary for accident investigation.

10.2 Coordination

This task requires coordination with the Director General, Director, Flight Standard Group Directors, the involved Airport Authority and Air traffic control facility.

10.3 References

- * The Nigeria Civil Aviation Regulations.
- * Technical guidance materials.



11.0 PROCEDURES

11.1 Receive Initial Notification.

- (1) Record the initial accident information.
- (2) Determine the type of accident, such as:
 - * Transport or Aerial Work Category
 - * Agricultural.
 - * Military.
- (3) Notify the Chairman of Flight Standard Group to contact the appropriate personnel and agencies as required by the category of accident. If the aircraft is a foreign registered aircraft, after receiving authorization from the AIB, contact the Accident Investigation Agency and Regulatory Authority of registry with the invitation to participate in the investigation.
 - * Determine NCAA responsibility in accordance with office policy.
- (4) Assignment of the NCAA Investigator-In-Charge by the Chairman of Flight Standard Group
- (5) Contact the aircraft and power plant manufacturers and invite their participation in the investigation in agreement with their

11.2 Initiate Organization of Investigation

- (1) If the accident involves an Air Traffic Centre, the Investigator-In-Charge should request the following information, as required:
 - * Flight progress strips.
 - * Air Traffic Centre tapes.
 - * Radar printouts.
 - * Weather information.



- (2) Determine what specialties will be required based on the initial accident information submitted (e.g., operations, airworthiness, avionics, aviation medical examiner (AME), coroner, pathologist, etc.).
- (3) Brief all participants on their responsibilities and the preliminary accident information.
- (4) Contact the nearest local law enforcement agency and/or airport security to:
 - (a) Provide accident site security until the arrival of Team of Accident Investigators.
 - (b) Ensure that rescue operations have been initiated.
 - * If rescue operations have not been initiated, take the necessary steps to begin rescue operations, if necessary.
 - * Determine if specialized personnel and/or equipment are required to begin or continue rescue operations.
- (5) Obtain the accident investigation kit from the office and proceed to the accident site.

11.3 Perform Preliminary on Site Investigation

NOTE: The Investigator-In-Charge must ensure that sufficient data is gathered to complete an aircraft report.

- (1) Determine if the accident site is safe for performance of investigation procedures.
 - (a) If it has been determined that the aircraft accident site is not safe for the preliminary investigation, contact the appropriate, local, authorities for assistance in controlling the hazard.
 - (b) If it has been determined that the aircraft accident site is safe for the investigation procedures, continue with preliminary investigation.



- (2) Ensure accident site security has been properly established.
- (3) Conduct an on-site briefing of participants, to include:
 - (a) Assigning responsibilities to each of the participant (e.g., photographic, witness statement, etc.)
 - (b) Assigning a time and place to meet after the preliminary investigation has been completed.
 - (c) Passing out any forms, instructions, or other material for participants to accomplish their assigned duties.
- (4) Determine the circumstances and factors surrounding the condition of personnel aboard aircraft, to include possible medical laboratory analysis, such as:
 - * Passengers -toxicity.
 - * Crewmembers - drug, alcohol, etc.
- (5) Determine the status of fatalities and injured, if applicable, to include:
 - (a) Who the medical personnel working at the accident site are/were.
 - (b) Where injured were taken.
 - (c) Where remains have been taken and if autopsies are required. If autopsies are required:
 - * Make necessary arrangements.
 - * Provide toxicology kit for crewmember autopsies.



- (6) Determine if mechanical laboratory analysis may be needed and how specimens will be obtained and transported, to include:
 - *Fuel samples.
 - *Oil samples.
 - *Metallurgy tests.
- (7) Ensure that the Emergency Locator Transmitter (ELT) has been deactivated.
- (8) Ensure that Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR) have been deactivated, if applicable.
- (9) Obtain the aircraft type, model, registration number, and serial number.
- (10) Ensure that personal items have been tagged and secured.
- (11) Obtain any eyewitness and survivor statements, to include the following:
 - (a) Securing copies of statements made prior to the inspector's arrival.
 - (b) Recording the names, addresses, and phone numbers of any eyewitnesses, survivors, relatives, etc., as applicable.
- (12) Determine the type of cargo, such as:
 - * Hazardous materials.
 - * Passenger baggage.
 - * Livestock.
 - * General cargo.
- (13) If a fire was involved, determine how the fire was started.
- (14) Obtain all of the required weather information.



- (15) Assess the topographical features of the accident site, such as:
 - * Visible damage path.
 - * Actual location of wreckage.
 - * Obstructions.
- (16) Determine if engineering assistance is required. Contact the Director General for list of DERs in the United States if engineering assistance is required. Arrange for a qualified DER to participate in the investigation.
- (17) Photograph the wreckage and any area associated with the accident to obtain an overall view of the site.
- (18) Prepare a wreckage distribution diagram which includes, if appropriate, body distribution.
- (19) Secure the aircraft records and pilot logbooks, if available.

11.4 Perform Wreckage Investigation.

- (1) Record external flight control positions (e.g., rudder, elevators, ailerons, flaps, slats, spoilers, stabilizers, tabs, etc.). Tag any parts as necessary.
- (2) Record all of the data from the cockpit flight control indicators.
- (3) Document the cockpit instrument readings.
- (4) Document the condition of cabin/cockpit area.
- (5) Document the burn pattern, if applicable.
- (6) Identify and document any structural failures and missing components.
- (7) Determine and record the amount of remaining fuel.
- (8) Obtain fuel, oil, and hydraulic fluid samples, as required.



11.5 Conclude Field Phase Investigation.

- (1) Release of Aircraft Wreckage and/or Parts, to the owner or the owner's designated representative.
- (2) Release the wreckage if the occurrence has been downgraded to an incident.
- (3) Review the witness statement to determine if the following is required:
 - * Re-interviewing of important witness.
 - * Acquiring additional witness statement.
- (4) Obtain preliminary findings of pathologist, coroner, or medical examiner, including crash injury information, as applicable.
- (5) Obtain preliminary toxicology results from laboratory.
- (6) Interview injured occupants, if applicable.

NOTE: Consent of the treating physician may be required.

- (7) Obtain injury status of all surviving aircraft occupants, if applicable.
- (8) Request copies of the activity logs and investigative reports of involved law enforcement agencies, firefighting, rescue services, and search and rescue organizations, as applicable.
- (9) Obtain and review copies of pertinent newspaper photographs and other media recordings, to check for items that may require follow-up.
- (10) Obtain appropriate local maps (city, airport, topographical, aeronautical, etc.) and/or aerial photographs.
- (11) Obtain data or information from the pilot's last departure point or home base (aircraft loading, refueling, maintenance, pilot's intent, etc.).



- (12) Review the Accident Report Information and all applicable report supplements to ensure that all locally available data is documented or requested. This applies especially to:
 - (a) Pilot training, certification, experience, background, medical condition, etc.
 - (b) Aircraft registration, airworthiness certificates, aircraft records, etc.
 - (c) Air Traffic Center communication, flight tracking, etc.
 - (d) Weather information.
 - (e) Airport conditions at the time of accident.
 - (f) Condition of pertinent NAVAIDS, ILS, etc.
- (13) Invite appropriate participants to observe the teardown or testing of retained parts and to participate in other follow-up activities, as applicable.
- (14) Confirm any agreement made to forward copies of specified documents, records, and manuals directly to the Investigator-In-Charge.
- (15) Obtain the necessary information and documentation needed to fulfill all of the NCAA financial obligations, to include:
 - * Guard services.
 - * Assistance from hired personnel.
 - * Rental equipment.
 - * Storage and transport of wreckage.
- (16) Inform the Director, Airworthiness Standards of the status of the investigation, to include:
 - * Current findings.
 - * Additional required tasks.



* Estimated time of return to the office or next destination.

(17) Debrief all NCAA participants prior to their departure from the accident site.

12.0 TASKOUTCOMES

12.1 Completion of this task will result in the following:

(1) Completion of Accident Report. Do not release the report until all NCAA deficiencies uncovered in the investigation have been reviewed and comments made by the appropriate personnel.

(2) A letter that includes recommendations for accident prevention.

12.2 Document the Task. Place a copy of all aircraft accident investigation related material in the appropriate office file.

13.0 FUTUREACTIVITIES

13.1 Conduct a violation investigation as applicable.