

SIERRA LEONE AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION BUREAU

POLICY AND PROCEDURES MANUAL





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SIERRA LEONE AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION BUREAU



Policy and Procedures Manual (PPM)

MAY 2023



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PREAMBLE



This Policy and Procedures Manual (PPM) is an internal document of Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB) (herein referred to as the Bureau). It contains information, policy, procedures and guidance needed to perform the statutory functions of the Bureau in the investigation of Aircraft Accidents and Incidents as required by the Civil Aviation Act, Part IX – *Aircraft Accident and Incident Investigations* and current Sierra Leone Civil Aviation Regulations, Part 13 – *Aircraft Accident and Incident Investigations*. It has been prepared for the use and guidance of all personnel of the Bureau, principally personnel who perform aircraft accident investigation duties.

The policies and procedures contained herein are in conformity with international standards and best practices. It was developed using the SARPs and guidance material promulgated by ICAO, as well as materials and best practices of some States. The content of this PPM is consistent with and is organized in accordance with guidance materials contained in the ICAO Doc 9962 - *Manual on Accident and Incident Investigation Policies and Procedures*. The provisions of this manual are binding on the actions of the Bureau, all its personnel, any other Sierra Leonean government agency, aviation industry organization and personnel, and other organizations and their personal from outside of Sierra Leone that participate in the Bureau-led investigations.

This manual is not a substitute for investigation training and experience, as well as common sense.

I require all staff to use the relevant portions of this manual in the performance of their duties. Personnel who perform aircraft accident investigation duties are expected to use good judgment in matters where specific guidance has not been given. Suggestions to improve format, presentation and contents of this manual are welcomed. All suggestions should be submitted to info@sl-aaiib.com.

I hereby approve this manual.


.....


Olubumi Roderick Wellington
Commissioner



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RECORD OF AMENDMENTS

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MANUAL AMENDMENT PROCEDURES

This Policy and Procedures Manual (PPM) is developed in fulfillment of the requirements of the Civil Aviation Act – PART IX Aircraft Accident and Incident Investigations, Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations and the relevant ICAO Standards and Recommended Practices (SARPs).

Therefore, amendment to the above legislation and the SARPs may affect a portion or the whole of this manual. As such, they shall be monitored by the Investigation Division Manager to capture any amendment to them that may affect this manual. Consequently, the affected portion of this manual is revised as soon as practicable by the Investigation Division Manager in coordination with Admin and Finance Manager, to ensure the changes are incorporated so that its contents remain up-to-date, pertinent and accurate.

Aside from amending the manual to incorporate changes in the Act, the regulations and the SARPs, the dynamic nature of the aviation industry and the speedy evolution of new technologies necessitate the need for periodic review of the contents of the PPM to capture new developments in the industry and international best practices.

Therefore, this manual shall be reviewed in its entirety at an interval of once in every three (3) years. Regular revision will ensure that the manual remains both pertinent and accurate.

The Commissioner has assigned the Investigation Division Manager to be responsible for among others, the review of the contents of this manual and to prepare timely amendments thereto, as necessary, to ensure it remains current and consistent with the standards and best practices of the international aviation community.

The initial issue of this manual shall have edition number 1, revision number 0 and the date are annotated on the footer of each page. Any 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 content of the manual or its pages, is revised, the amendment shall be given the next consecutive number, while the revision number starts afresh from zero (0).

This PPM is a controlled document of the Bureau to be used by Investigators and other relevant personnel as a guidance material. The Investigation Division Manager has the Master Copy of this PPM. A digital copy of the Manual is uploaded onto the Bureau's website by the ICT Officer for access by all Bureau's staff and the general public. Any copy printed or downloaded from the website shall be deemed to be valid only for that period. Enquiries about the most up-to-date version of the PPM shall be forwarded to the Investigation Division Manager. All personnel who perform aircraft accident investigation duties and others who need to use this manual during performance of their assigned duties shall ensure that they obtain and use the most up-to-date version.



Readers and users are welcome to submit their suggestions for improving the manual in terms of its format, contents or presentation. Any such recommendation or suggestion will be examined by the Investigation Division Manager and, if found suitable, will be included in the next amendment of the manual upon approval by the Commissioner.

Suggestions and Comments concerning this manual should be addressed to: info@sl-aiib.com.

The Commissioner of the Bureau is accountable for approving the contents and amendments of this Manual.



DEFINITION OF TERMS

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

- a) **Accident:** As defined in SLCAR Part 13.
- b) **Accident Investigation Authority:** As defined in SLCAR Part 13.
- c) **Accredited Representative:** As defined in SLCAR Part 13.
- d) **Adviser:** As defined in SLCAR Part 13.
- e) **Aircraft:** As defined in SLCAR Part 13.
- f) **Authority:** Sierra Leone Civil Aviation Authority.
- g) **Balancing test:** As defined in SLCAR Part 13.
- h) **Bureau:** Sierra Leone Aircraft Accident and Incident Investigation Bureau.
- i) **Causes:** As defined in SLCAR Part 13.
- j) **Competent authority:** As defined in SLCAR Part 13.
- k) **Contracting State:** As defined in SLCAR Part 13.
- l) **Contributing Factors:** As defined in SLCAR Part 13.
- m) **Crew:** Every person employed or engaged in an aircraft in flight on the business of the aircraft.
- n) **Commissioner:** As defined in SLCAR Part 13.
- o) **Dangerous Goods:** As defined in SLCAR Part 13.
- p) **Draft Final Report:** As defined in SLCAR Part 13.
- q) **Fatal Injury:** As defined in SLCAR Part 13.
- r) **Final Report:** As defined in SLCAR Part 13.
- s) **Flight recorder:** As defined in SLCAR Part 13.
- t) **Incident:** As defined in SLCAR Part 13.
- u) **Investigation:** As defined in SLCAR Part 13.
- v) **Investigator:** A person engaged in the investigation of aircraft accidents, incidents and other aviation safety hazards.
- w) **Investigator-in-charge:** As defined in SLCAR Part 13.
- x) **Interim Statement:** As defined in SLCAR Part 13.
- y) **Maximum Mass:** As defined in SLCAR Part 13.
- z) **Minister:** As defined in SLCAR Part 13.
- aa) **Next-of- kin:** As defined in SLCAR Part 13.
- bb) **Observer:** As defined in SLCAR Part 13.
- cc) **Occurrence:** As defined in SLCAR Part 13.
- dd) **Operator:** The person, organization or enterprise engaged in or offering to engage in an aircraft operation.
- ee) **Pilot-in-Command:** As defined in SLCAR Part 13.
- ff) **Police Officer:** As defined in SLCAR Part 13.
- gg) **Preliminary Report:** As defined in SLCAR Part 13.
- hh) **Regulations:** As defined in SLCAR Part 13.



- ii) **Relevant record:** Any item in the possession, custody or power of the Commissioner which is of a kind referred to above.
Note.— Nothing in the above definition is intended to preclude the functions of an investigator in charge being assigned to a commission or other body.
- jj) **Safety recommendation:** As defined in SLCAR Part 13.
- kk) **Safety Recommendation of Global Concern (SRGC):** As defined in SLCAR Part 13.
- ll) **Serious incident:** As defined in SLCAR Part 13.
- mm) **State:** A Contracting State of the International Civil Aviation Organization.
- nn) **State of Design:** As defined in SLCAR Part 13.
- oo) **State of Manufacture:** As defined in SLCAR Part 13.
- pp) **State of Occurrence:** As defined in SLCAR Part 13.
- qq) **State of the Operator:** As defined in SLCAR Part 13.
- rr) **State of Registry:** As defined in SLCAR Part 13.
- ss) **State Safety Programme (SSP):** As defined in SLCAR Part 13.
- tt) **Statement:** The whole or any part of an oral, written or recorded statement relating to an aircraft accident given by the author of the statement to the Bureau.
- uu) **The Annex:** As defined in SLCAR Part 13.
- vv) **Witness:** As defined in SLCAR Part 13.



LIST OF ACRONYMS

ACCID	Accident
ADREP	Accident/Incident Data Reporting System
AIA	Accident Investigation Authority
AIG	Accident Investigation and Prevention
AIP	Aeronautical Information Publication
ASI	Investigator
ATC	Air Traffic Control
ATS	Air Traffic Services
BAGAIA	Banjul Accord Group Accident Investigation Agency
CMA	Continuous Monitoring Approach
CVR	Cockpit Voice Recorder
ECCAIRS	European Coordination Centre for Accident And Incident Reporting Systems
FDR	Flight Data Recorder
FMS	Flight Management System
FNA	Freetown International Airport
GLONASS	Global Navigation Satellite System
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
ICAO	International Civil Aviation Organization
ICT	Information and Communication Technology
IDP	Individual Development Plan
IIC	Investigator-In-Charge
INCID	Incident
ISASI	International Society of Investigator s
MoU	Memorandum of Understanding
NSIB	Nigerian Safety Investigation Bureau
NDMA	National Disaster Management Agency
OJT	On-The-Job Training
PPM	Policy and Procedures Manual
RAIO	Regional Accident and Incident Investigation Organization
ROV	Remotely Operated Vehicle



SARPs	Standards and Recommended Practices
SEM	Scanning Electron Microscope
SDCPS	Safety Data Collection and Processing Systems
SINCID	Serious Incident
SLAA	Sierra Leone Airports Authority
SL-AAIIB	Sierra Leone Aircraft Accident and Incident Investigation Bureau
SLCAA	Sierra Leone Civil Aviation Authority
SLCAR	Sierra Leone Civil Aviation Regulations
SLMA	Sierra Leone Maritime Administration
SLMet	Sierra Leone Meteorology
SL	State Letter
SRGC	Safety Recommendation of Global Concern
SSP	State Safety Programme
TAWS	Terrain Awareness and Warning System
TCB	Technical Co-Operation Bureau
ULB	Underwater Location Beacon
USOAP	Universal Safety Oversight Audit Programme



ORGANIZATION



CHAPTER 1 - INTRODUCTION

1.1 GENERAL

- 1.1.1 This manual contains the policies and procedures for the investigation of civil aircraft accidents and incidents that occur in the Sierra Leonean territory. It also contains investigation policies and procedures for the Bureau and other Sierra Leonean organizations when participating in investigations of accidents and incidents that occur outside of Sierra Leonean territory, but involving Sierra Leonean interests, including Sierra Leonean citizens who suffered fatalities or serious injuries. An organizational chart of the Bureau is contained in Chapter 3 of this manual.
- 1.1.2 The policies and procedures contained herein are in conformity with international standards and best practices.
- 1.1.3 This manual was developed using the SARPs and guidance material promulgated by ICAO, as well as materials and best practices of some States.
- 1.1.4 The provisions of this manual are binding on the actions of the Bureau including its Technical and Management Personnel. The provisions of this manual are also binding on any other Sierra Leonean government agency, aviation industry organizations and personnel, and other organizations and their personal from outside of Sierra Leone that participate in the Bureau-led investigations.

Note 1— Since investigations vary in complexity, a document of this kind cannot cover all eventualities. The more common techniques and processes, however, have been included. Although this manual may be of use for experienced and inexperienced Investigators alike, it is not a substitute for investigation training and experience, as well as common sense.

Note 2— Because this manual deals with investigations of accidents, serious incidents and incidents, for reasons of brevity, the terms “accidents,” “investigations” and “accident investigations”, as used herein, should apply equally to the investigation of accidents, serious incidents, and incidents.



1.2 STATE SAFETY PROGRAMME

- 1.2.1 In compliance with provisions of ICAO Annex 19 – Safety Management, Sierra Leone, being an ICAO Member State has established and maintained a State Safety Programme (SSP) that is commensurate with the size and complexity of the country’s aviation system. The implementation of an SSP requires coordination among multiple authorities responsible for individual element functions in Sierra Leone.
- 1.2.2 The SSP framework contemplates four components. The first component is “State safety policy and objectives”, second component is “State safety risk management” and its third element is State safety assurance and the fourth is State safety promotion. The investigation process has a pivotal role in the SSP, enabling the Bureau to identify causes and/or contributing factors and to generate the necessary countermeasures to prevent recurrence.
- 1.2.3 The Bureau is independent from the Sierra Leone Civil Aviation Authority (SLCAA) and any other entities that could interfere with the conduct and objectivity of its investigation process, the sole objective of which is the prevention of accidents and incidents, and not the apportioning of blame or liability. Such investigations are in support of the management of safety in Sierra Leone. In the operation of the SSP, Sierra Leone maintains the independence of the Bureau from other civil aviation authorities.
- 1.2.4 The Investigation Division Manager of the Bureau is responsible for coordinating with other relevant entities on all activities relating to the development, implementation and maintenance of the State Safety Programme.
- 1.2.5 The Bureau has developed this manual as part of its efforts in support of Sierra Leone to implement and maintain its SSP.
- 1.2.6 The Sierra Leone Civil Aviation Authority (SLCAA) is the Placeholder of the SSP, while the Director-General of the SLCAA is appointed Accountable Executive for the SSP. The Bureau is a member of the SSP Coordination Committee.
- 1.2.7 For further details on the SSP, refer to the State Safety Programme of Sierra Leone document.



1.3 BACKGROUND DOCUMENTS

- 1.3.1 The following documents provide additional information and guidance on related subjects:
- a) Civil Aviation Act of Sierra Leone
 - b) Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations
 - c) Annex 13 – Aircraft Accident and Incident investigation
 - d) Manual on Accident and Incident Investigation Policies and Procedures (Doc. 9962)
 - e) Manual of Aircraft Accident and Incident Investigation (Doc 9756):
 - Part I — Organization and Planning
 - Part II — Procedures and Checklists
 - Part III — Investigation
 - Part IV — Reporting
 - f) Manual on Regional Accident and Incident Investigation Organization (Doc 9946)
 - g) Model Accident Investigation Authority Act
 - h) Model Aircraft Accident and Incident Investigation (AIG) Regulations
 - i) Investigation of Human Factors in Accidents and Incidents (Circular 240)
 - j) Human Factors Training Procedure Manual (Doc 9683)
 - k) Manual of Civil Aviation Medicine (Doc 8984)
 - l) Safety Management Manual (SMM) (Doc 9859)
 - m) Airport Services Manual (Doc 9137), Part 5 — Removal of Disabled Aircraft
 - n) ICAO Policy on Assistance to Aircraft Accident Victims and their Families (Doc 9998)
 - o) Manual on Assistance to Aircraft Accident Victims and their Families (Doc 9973)
 - p) Guidance on Assistance to Aircraft Accident Victims and their Families (Circular 285)
 - q) Training Guidelines for Aircraft Accident Safety Investigators (Circular 298)
 - r) Hazards at Aircraft Accident Sites (Circular 315)
- 1.3.2 The Commissioner is responsible to maintain subscriptions of the relevant ICAO documents (Annexes, Guidance materials, Circulars, etc.) and aircraft documentations of certain aircraft manufacturers that are prevalent in our airspace, including Airbus, Boeing, Embraer.
- 1.3.3 The ICT Officer shall ensure that all personnel have access to these documentations that are available in the Bureau’s shared drive whenever and wherever they need to use them, the personnel will use an official email and password to have login access to the shared drive (online).
- 1.3.4 The Bureau’s relevant personnel will have access to the ICAO Secure Portal through request from this link portallogin.icao.int.



CHAPTER 2 - LEGISLATIVE REQUIREMENTS

2.1 ICAO REQUIREMENTS

Article 26 of the Convention on International Civil Aviation specifies that it is incumbent on a State in which an aircraft accident occurs to institute an inquiry into the circumstances of the accident. This obligation can only be met when appropriate legislation is in place. Such legislation must establish an accident investigation authority (or commission, board or other body) for the investigation of aircraft accidents. ICAO Annex 13 contains SARPs for the investigation of accidents and incidents in ICAO Member States. Civil Aviation Act of Sierra Leone, Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations are in place in Sierra Leone to address these international requirements.

2.2 THE REQUIREMENTS IN SIERRA LEONE

2.2.1 General

Sierra Leone has adopted legislation, regulations, policies and procedures that meet the requirements of ICAO for accident and incident investigation. However, the Bureau shall file “differences” to ICAO in accordance with Article 38 of the Convention, where required in line with the procedures in 2.3 of this manual.

2.2.2 Legislation in Sierra Leone

2.2.2.1 The legislative basis for the policies and procedures contained in this manual are codified in the Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations. Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations. This legislative basis illustrates Sierra Leone’s commitment to comply with the Chicago Convention, particularly Article 26 of the Convention, and the SARPs contained in ICAO Annex 13.

2.2.2.2 Civil Aviation Act Part IX – Aircraft Accidents and Incidents Investigations:

- a) establishes the Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB);
- b) demonstrates the independence of the Bureau from Sierra Leone Civil Aviation Authority and other entities that could interfere with the conduct or objectivity of an investigation;
- c) provides it with the responsibilities and authorities (including funding) regarding civil aviation accident and incident investigation on behalf of Sierra Leone; and



- d) authorizes the publication of Sierra Leone Civil Aviation Regulations. Part 13 – Aircraft Accident and Incident Investigations regarding investigations of accidents and incidents.

2.2.3 Regulations in Sierra Leone

The regulatory basis for the policies and procedures contained in this manual are codified in the Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations. Civil Aviation Act Part IX – Aircraft Accidents and Incidents Investigations empowers the Commissioner of the Bureau to make the regulations for investigation of air accidents and incidents in Sierra Leone. The Regulations address the requirements emanating from the Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations, and provide for standardized investigation processes consistent with the provisions of ICAO Annex 13 and other ICAO documents regarding accident and incident investigation, including the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Parts I, II, III and IV.

2.3 RULE MAKING PROCEDURES

2.3.1 General

The primary purpose of this procedure is to describe the rulemaking processes and to provide guidance to the Bureau’s Personnel and other entities involved in the development of Regulations and related matters to ensure timely transposition of latest amendment of Annex 13 into the Regulations and related matters.

2.3.1.1 Functions and responsibilities.

2.3.1.1.1 The Commissioner shall be responsible for:

- (a) Appointing of Focal Point;
- (b) Approving of publication of NPA;
- (c) Approving the amendment to regulations;
- (d) Approving the differences identified as significant;
- (e) Approving the CC and EFOD;
- (f) Approving publication of regulations, orders, circulars, bulletins and directives.

2.3.1.1.2 The Investigation Division Manager shall be responsible for:

- (a) Making recommendations to amend applicable sections of the SLCARs.
- (b) Coordination with the Focal Point on the consultation and review of NPA/CRD within the division.
- (c) Making inputs into drafting of Regulation, Directives, Orders, Bulletins and Circulars
- (d) Making inputs into the review of ICAO State Letters related to ICAO Annex 13 Amendments.
- (e) Working with the Bureau’s Focal Point on the completion of Compliance Checklist/Electronic Filing of Difference (CC/EFOD).



2.3.1.1.3 The Focal Point:

2.3.1.1.3.1 The Bureau's Focal Point for ICAO Universal Safety Oversight Audit Program (USOAP) Continuous Monitoring Approach (CMA) shall be a Senior Technical Personnel appointed by the Commissioner to act as primary point of contact for all USOAP CMA processes and activities.

2.3.1.1.3.2 The Focal Point shall be responsible for:

- (a) Interactions with ICAO and all Civil Aviation Organizations and stakeholders with regards to amendments to the Sierra Leone Civil Aviation Regulations;
- (b) Acknowledging receipt of Proposals for amendment of the Rules
- (c) Periodic check of status of ICAO State Letters on the ICAO secured Portal.
- (b) Coordination of civil aviation international issues largely relating to amendment of ICAO Annex 13;
- (c) Monitoring of amendments to SARPs contained in the Annex 13 to the Convention on International Civil Aviation
- (d) Incorporating the amendments into the Sierra Leone Civil Aviation Regulations Part 13, Aircraft Accident and Incident Investigation;
- (e) Assessing proposal for amendment to the SLCARs Part 13, Aircraft Accident and Incident Investigation made by stakeholders and other members of the public;
- (f) Coordinating all internal and external ICAO USOAP CMA activities related Accident and Incident Investigation (AIG);
- (f) Coordinating ICAO Online Format (OLF) platform activities;
- (g) Ensures data updated in USOAP CMA OLF platform;
- (h) Coordinating development and management of the Bureau's Corrective Action Plans to address all ICAO USOAP CMA AIG Findings;
- (i) Attending meetings, trainings or workshops related to ICAO USOAP CMA activities;
- (j) Participating in the review and impact assessment of ICAO State Letters (SLs) and associated documents submitted to the Bureau;
- (k) Advising the Commissioner on the amendment of Aviation Act, Regulations and associated Manuals/Handbooks/documents with regards to the SLs on relevant ICAO Annexes and Guidance Materials;
- (l) Liaising with the National Continuous Monitoring Coordinator (NCMC) on matters relating to ICAO USOAP CMA on AIG;
- (m) Conducting Self-Assessment of AIG part on the OLF;
- (n) Completing and submitting Electronic Filling of Differences (CC-EFOD) to ICAO of AIG part on the OLF upon completion of the Rulemaking processes;

2.3.1.1.4 Members of staff

All members of staff from time-to-time are encouraged to review the Regulations and provide suggestions for improving the Regulations based on the challenges they encounter with respect to the execution of assigned duties through their respective Heads to the Investigation Division Manager.

2.3.2 RULE MAKING PROCEDURES

The steps for developing rules are:



- (a) Initiation of the rule;
- (b) Drafting of the rule;
- (c) Stakeholders’ consultation of the Notice of Proposed Amendment (NPA); which contains the draft rule and the Regulatory Impact Assessment (RIA);
- (d) Analysis of comments received from stakeholders through Comment Response Document (CRD), together with the Bureau’s responses to the comments;
- (e) Final review for adoption and publication of the Rule.

The table below contains the Rule Making Milestones and Timelines.

SN	Rule Making Steps	Milestones	Timelines, Days
1	Initiation of the rule	Draft texts of the rule	0-30
2	Drafting of the rule	Notice of Proposed Amendment (NPA)	20-30
3	Consultation	Comments	20-45
4	Analysis of comments	Comment Response Document (CRD)	20-30
5	Final Review, Adoption and Publication of the Rule	Published Rule	30-45

2.3.2.1 Initiation of the rule

- (a) The process starts with the receipt of a proposal for rulemaking. The proposal can be ICAO State Letter (SL) containing adoption of amendment of Annex 13 or relevant ICAO documents normally received through the SLCAA Focal Point for ICAO SLs; or it can come from internal sources (individual staff member of the Bureau) or external sources, including member of the public, aviation stakeholder, an entity.
- (b) In addition, A proposal for introduction, amendment or withdrawal of a provision of the regulation will be initiated due to any of the following reasons:
 - i) An amendment to the aviation legislations that affects Aviation Safety and Security;
 - ii) Emerging new technology or scientific data;
 - iii) Required reviews;
 - iv) Statutory mandates;
 - v) Lawsuits;
 - vi) Petitions;
 - vii) Recommendations from other external agencies/government bodies;
 - viii) Other operational and environmental demands;
 - ix) When a certain provision of the regulation is no longer relevant, applicable or effective.
- (c) Upon receipt of the proposal, the Commissioner will forward it to the Focal Point on the same day for acknowledgement and preliminary review. The Focal Point will reply in a transmittal letter to the address of the proposer within two (2) days of receipt, indicating that the proposal is receiving attention of the Bureau.
- (d) For handling ICAO State Letters on adoption of amendment to Annex13 and other relevant ICAO Doc refer to section 2.6 below.
- (e) The initiation process should be completed within 30 days from the date of receipt of the proposal.

2.3.2.1.1 Submission of a proposal



A proposal to amend, adopt or repeal a regulation should be submitted to the Commissioner using the following methods:

- (i) Email: info@sl-aaib.com;
- (ii) Letter: Addressed to the Commissioner, Sierra Leone Aircraft Accident and Incident Investigation Bureau, 21/23 Siaka Stevens Street, National Development Bank (NDB) Building Freetown;
- (iii) Hand Delivery or Courier: The Office of the Commissioner, Sierra Leone Aircraft Accident and Incident Investigation Bureau, 21/23 Siaka Stevens Street, National Development Bank (NDB) Building Freetown;

2.3.2.1.2 Content of the proposal

- (a) The following information should be included in the proposal:
 - (i) Name, mailing address, telephone number, or e-mail address of the proposer. Other contact information such as a fax number is optional;
 - (ii) An explanation of the proposer's interests and its purpose;
- (b) State the contents of the regulation, technical standard or amendment proposed or specify the regulation or technical standard which the proposer wishes to be withdrawn:
 - (i) An explanation of why the proposed action would be in the public interest;
 - (ii) Information, views and arguments that support the proposed action, including relevant technical and scientific data available to the proposer;
 - (iii) Any specific facts or circumstances that support or demonstrate the need for the action being proposed.
- (c) The following information may be required:
 - (i) The costs and benefits of the proposed action to society in general, and identifiable groups within the society in particular;
 - (ii) The regulatory burden of the proposed action on small businesses, small Organizations, small governmental jurisdictions;
 - (iii) The recordkeeping and reporting burdens of the proposed action and whom the burdens would affect;
 - (iv) The effect of the proposed action on the quality of the natural and social environments.
- (d) It is recommended that the proposal be submitted using the form in Appendix R1.

2.3.2.1.3 Preliminary Review

- (a) The Commissioner will forward proposal (ICAO State Letters or from other sources) for amendments to the Focal Point on the same day it was received.
- (b) The Focal Point will, in conjunction with relevant heads of technical unit, conduct the preliminary review of the proposal to determine if it is justified. The review will take account of the following:
 - (i) The urgency of the safety concerns raised;
 - (ii) The priority of other issues the Bureau must deal with;
 - (iii) The resources available to address these issues;
 - (iv) If an NPA has been previously issued by the Bureau on the subject matter, the proposer's request for a Regulation change will be treated as his or her comments on the subject and not as a separate action. This also applies if a rulemaking project has begun on the same subject; and
 - (v) The preliminary assessment of the impact of the proposal.
- (c) Thereafter, the Focal Point will prepare and forward to the Commissioner a report stating the result of the review, including recommendation for proposed action.



2.3.2.1.4 Acceptance of Proposal/Public Meeting

- (a) If the Commissioner determines that implementation of the proposal is justified, the Commissioner will request the Focal Point to prepare an NPA incorporating a draft of the proposed amendment for subsequent publication.
- (b) A proposer may request a public meeting. The Bureau may hold a public meeting when more than written comments are needed to make a fully informed decision. A proposer requesting public comment shall submit his or her written request that the Bureau holds a public meeting not later than 30 working days after issuance of the NPA. (c) If the Bureau agrees to convene a meeting, it shall publish a notice of the meeting in the website. On the alternative notice of the meeting can be sent via letters to the industry.

2.3.2.1.5 Dismissal of Proposal

If the Commissioner in consultation with the Focal Point, identifies that the issues raised by the proposer may have merit, but do not address an immediate safety concern or cannot be addressed because of other priorities and resource constraints, the proposal may be dismissed. The comments and arguments for a rule change will be placed in a database (Master Inventory (MTL – Master Tasks List)), which will be examined at an appropriate time in future.

2.3.2.2 Drafting of the rule

2.3.2.2.1 Drafting the Notice of Proposed Amendment (NPA)

This process starts with the drafting of the Notice of Proposed Amendment (NPA) by the Focal Point. It should be completed within 20 to 30 days.

2.3.2.2.2 A sample Notice for Proposed amendment of Regulation is in Appendix R2.

2.3.2.2.3 The full Regulatory Impact Assessment (RIA) is developed in parallel to the drafting of the rule as an integral part of the NPA to support the decision-making process, with the objective to ensure that their content is based on evidence and sound analysis, and to assess the need for a performance-based approach.

2.3.2.2.4 Regulatory Impact Assessment (RIA) is a systemic approach to critically assessing the positive and negative effects (in terms of safety, security, environmental, level playing field or proportionality/efficiency aspects) expected from the proposed regulation as well as its implementation cost to the Bureau and those subject to its provisions measured in relation to the option to not issue a regulation.

2.3.2.2.5 The aim of the RIA shall be to improve the quality of regulations by helping ensure well substantiated decisions.

2.3.2.2.6 The RIA shall be conducted based on the principle of proportionate analysis: in-depth analysis to be performed for rulemaking projects with expected high impact, and light analysis for rulemaking projects with expected lower impact.

2.3.2.2.7 The RIA Form (refer to Appendix R3) will be reviewed by the Focal Point as part of the rulemaking process and should be attached to every drafted regulation by the focal point.

2.3.2.2.8 The draft NPA should include the following information:

- a) An explanatory note describing:



- (i) The development process, including the type and the estimated length of the consultation period as well as a planned date for the publication of the related Comment Response Document (CRD) and the final rule;
 - (ii) A summary of the proposed changes and full details of significant, contentious or interface issues identified during the drafting process; and
 - (iii) Details of the situation with respect to applicable ICAO SARPs and harmonization with other aviation authorities or international organisations;
- b) The proposed draft rule;
 - c) A RIA, if applicable;
 - d) Proposed actions to support implementation.

2.3.2.2.9 The Focal Point shall evaluate whether the NPA contains provisions to be applied by the Bureau. In such a case, the Focal Point has to notify the Bureau Divisions when the NPA contains provisions they have to implement (only if it is applicable).

2.3.2.2.10 The Focal Point should transmit the draft NPA to the applicable divisions for internal consultation. At this stage, it is important to verify whether the normal consultation period of 3 months applies or whether there is a need for a shorter/longer consultation period because of the potential impact and complexity of the rule envisaged. If so, the “change of consultation period” process is applicable (see Section 2.3.2.3).

2.3.2.2.11 The various contributions from the interdivisional consultation are collected and the draft NPA amended as appropriate by the focal point.

2.3.2.2.12 Upon the completion of the draft NPA, it is transmitted to the Commissioner for endorsement. Once approved, the Commissioner will direct head of ICT to immediately publish the approved NPA on the Bureau’s website and request the Admin Officer to initiate and dispatch transmittal letters to stakeholders inviting their comments on the NPA.

2.3.2.2.13 The head of ICT will upload the approved NPA in the Bureau’s website with an indication of the start/end date of publication, together with the following information:

- (a) The regulation involved;
- (b) The proposed rule;
- (c) The Bureau’s legal authority for issuing the proposal;
- (d) An explanatory note describing the development process;
- (e) Full details of significant or contentious or interface issues identified during the drafting process;
- (f) Details of the situation with respect to applicable ICAO Standards and Recommended Practices and relative to harmonization with other accident investigation authorities or International Organisations; and
- (g) A full Regulatory Impact Assessment;
- (h) How interested persons may respond (for example, by filing written comments or making oral presentations at a public meeting);
- (i) Persons to contact if there are issues requiring clarification;
- (j) The date, time, and place of any public meetings the Bureau will hold to discuss the proposal.

2.3.2.2.14 A template of Notice for Proposed Change in Regulation Document is in Appendix R2.

2.3.2.2.15 The final step is the filing of the following records in the rule making file by the Focal Point:

- (a) The submission initiating the NPA;
- (b) The published NPA including justification and Regulatory Impact Assessment;



- (c) The Comment Response Document(s);
- (d) Minutes of meetings (internal memos);
- (e) Documents submitted and discussed; and
- (f) All relevant correspondences.

2.3.2.3 Stakeholders' consultation

2.3.2.3.1 Any person or organisation with an interest in or being affected by the draft proposed rule may submit their comment on the published NPA.

2.3.2.3.2 In those cases where the NPA contains provisions to be applied by Bureau Divisions, they should be notified by the focal point.

2.3.2.3.3 The public consultation period is for a minimum of one (1) month. However, due to unforeseen exigencies, such as an emergency need to promulgate the Regulations within a very short timeframe, the Commissioner may approve that the consultation period be reduced to one week or less.

2.3.2.3.4 During the public consultation period, the Commissioner, at the request of industry (Aircraft Owners/Operators, Airport Operators, Air Traffic Services Providers/ Maintenance Organizations, Training Organizations, etc.) or interested parties, may extend in exceptional and duly justified cases, the public consultation period specified in the NPA. Such changes to the length of the public consultation period shall be published on the Bureau's website or a transmittal letter issued to all recipients of the NPA.

2.3.2.3.5 Comments on the NPA should be forwarded to the Commissioner and should contain the following:

- (a) Identification of the commentator;
- (b) NPA reference number; and
- (c) Position of the commentator with regard to the proposal (including justification for the position taken).

2.3.2.3.6 The Focal Point shall continuously monitor the consultation process for the registration of comments received and checks for requests by interested parties to extend the public consultation period.

2.3.2.3.7 Extension of consultation period during consultation starts with a request by an interested party to extend the public consultation period of an ongoing consultation. The request is submitted to the Focal Point to evaluate the quality of the justification. In his/her evaluation the Focal Point shall take account of the complexity of the rule published, the implications of the rule on regulated parties, any controversial issues and the period of publication.

2.3.2.3.8 If the Focal Point finds the request for extension of the public consultation period justifiable, he should recommend it to the Commissioner for verification and approval.

2.3.2.3.9 Once approved, the head of ICT should publish on the website the new timetable for public consultation for the NPA in question.

2.3.2.3.10 The time frame from publishing the NPA to the completion of the consultation, and holding of meeting if applicable, should take between 20 to 30 days.

2.3.2.3.11 The final step is the filing of all records in accordance with the archiving policy.

2.3.2.4 Analysis of comments

2.3.2.4.1 Following elapse of the consultation period, receipt of comments, the Focal Point, in coordination with the relevant heads of Divisions of the Bureau should undertake a review of the comments received from



stakeholders, provide response to the comments and adapt the proposed rule as appropriate in order to produce a Comment Response Document (CRD).

- 2.3.2.4.2 This document shall reproduce the comments received on the individual issues and the respective responses provided and amendments to the proposed regulation. It may contain a list of all persons and/or organizations that have provided comments and the Bureau's responses to those comments.
- 2.3.2.4.3 If the outcome of the review of the comments is that the revised text differs significantly from that presented at the beginning of the consultation process, the Commissioner in coordination with the relevant heads of divisions and Focal Point shall consider further consultation with the stakeholders. Upon verification and approval by Commissioner, the shall include a note in the explanatory part of the CRD, stating that the initial NPA will result in the publication of a new one. The reasons behind the decision should be also given. A new number will be later on assigned to the new NPA, but at this stage, reference to the title should be included in the CRD. This is especially important if changes of the title are envisaged. The Focal Point shall then request ICT to publish the CRD in the Bureau's website and proceed with the drafting of the new NPA.
- 2.3.2.4.4 The CRD shall be submitted for approval by the Commissioner and upload on the Bureau website. The CRD may contain a list of all persons and/or Organizations that have provided comments. It will be available for 30 days after consultation has closed. To ensure publication of the CRD within the 4 months' timeframe, the review process is continuously monitored. If the 4 months period cannot be met, the process "Extension of Period for CRD Publication" will be applied.
- 2.3.2.4.5 Further consultation with consultees may be undertaken as necessary for the sole purpose of ensuring a better understanding of the comments received.
- 2.3.2.4.6 The Focal Point shall review the comments received and shall publish the outcome of the consultation on the Bureau's website.
- 2.3.2.4.7 If, based on the number or complexity of the comments received, the Bureau is unable to publish the CRD within the timescale indicated in the NPA, amendments to the timescale shall be published on the Bureau's website.
- 2.3.2.4.8 The Focal Point in coordination with the Investigation division Manager shall fill the offline version of CC/EFOD form to determine if the new changes to the regulations introduce difference or no difference with the current ICAO Annex 13 to the Chicago Convention. The Focal Point shall forward the reviewed CC/EFOD together with recommendations to the Commissioner for approval.
- 2.3.2.4.9 The Focal Point is responsible for filing of the Comment Response Document and all associated comments received in the rule making file.
- 2.3.2.5 **Adoption and Publication**
 - 2.3.2.5.1 The Commissioner shall issue his decision in respect of the rule in question together with the CRD.
 - 2.3.2.5.2 Rules issued by the Commissioner shall be published on the Bureau's website together with an explanatory memorandum and, in the case of opinions, a revised RIA if the final text differs significantly from that presented at the beginning of the consultation.
 - 2.3.2.5.3 This process starts following the adoption of text of the draft rule upon completion of the consultation period.



- 2.3.2.5.4 After 2 months following the publication of the Comment Response Document and once the rule is approved by the Commissioner, the Focal Point should transmit the approved rule to the Manager Admin and Finance for archiving in accordance with extant laws.
- 2.3.2.5.5 The Commissioner shall approve and cause to be published the implementation date of the Regulations where applicable.
- 2.3.2.5.6 The Focal Point shall upload the filled offline version of CC/EFOD form to the ICAO OLF as a means of filing of differences.
- 2.3.2.5.7 The Commissioner shall direct the head of ICT to publish the copy of the rule (revised regulations) on Bureau's official website and should notify other stakeholders about the publication through transmittal letters.
- 2.3.2.5.8 The final step is the filing of the final rule in the rule making file by the Focal Point.

2.4 PROCEDURE FOR ISSUING INVESTIGATION ORDER

2.4.1 PURPOSE

This section provides direction and guidance on developing, making, issuing and amending of investigation related Orders and related matters in accordance with the powers conferred by Section 82(1) of the Civil Aviation Act of Sierra Leone Part IX – *Aircraft Accident and Incident Investigation*.

2.4.2 ISSUING OR AMENDING INVESTIGATION ORDER (IO)

The Commissioner will issue or amend Investigation Order for inter alia any of the following reasons:

- (a) An urgent need to amend the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations for Aviation Safety exigencies; or
- (b) An amendment to an ICAO Annex or document where it is impracticable to amend Sierra Leone Civil Aviation Regulations Part 13 - (Aircraft Accidents and Incidents investigation) after the applicability date of the ICAO annex.

2.4.2.1 DRAFTING AND ISSUING/AMENDING OF THE INVESTIGATION ORDER

- 2.4.2.1.1 The process starts with drafting of the Order by the Focal Point.
- 2.4.2.1.2 The Focal Point will deliberate on the Investigation Order and make appropriate recommendation to the Commissioner for issuing or amendment of an existing Order in the format in Appendix R4.
- 2.4.2.1.3 There shall be no public consultation because of the urgent and special nature of the Order. Public consultation shall take place when Investigation Order is being consolidated into the Regulations following the Rulemaking Procedures of section 2.3 of this manual.
- 2.4.2.1.4 Commissioner shall issue/amend the Investigation Order by publishing on the Bureau's Website.
- 2.4.2.1.5 The Focal Point should maintain a Master Inventory List of all Investigation Orders issued/amended by Bureau stating effective date, amended date, and cancelled date. Investigation Order reference will carry the following format SL-AAIIB/IO/YYYY/NNN e.g. First Investigation Order issued in year 2023 will be SL-AAIIB/IO/2023/001.



- 2.4.2.1.6 The Investigation Order issued/amended by Commissioner shall remain effective until amended or repealed.
- 2.4.2.1.7 The Order shall subsist until consolidated into the Regulations.
- 2.4.2.1.8 Organization of the Investigation Order is sub-divided into five hierarchical categories as follows:
 - (a) Part refers to the primary subject area;
 - (b) Subpart refers to any subdivision of a Part;
 - (c) Section refers to any subdivision of a Subpart;
 - (d) Subsection refers to the title of an Investigation Order and can be a subdivision of a Subpart or Section;
 - (e) Paragraph refers to the text describing the Investigation Order. All paragraphs are outlined alphanumerically in the following hierarchical order: (a), (1), (i), (A).
- 2.4.2.1.9 The Investigation Order also comprises the rules just like the Sierra Leone Civil Aviation Regulations, Part 13 - Aircraft Accidents and Incidents Investigation.

2.5 ISSUING INVESTIGATION DIRECTIVE AND BULLETINS

- 2.5.0.1 This section provides direction and guidance on developing, making, issuing and amending of investigation related Directives and Bulletins in accordance with the powers conferred by Section 82(1) of the Civil Aviation Act of Sierra Leone Part IX – *Aircraft Accident and Incident Investigation*.
- 2.5.0.2 The Commissioner will issue Investigation Directive to require a mandatory action or compliance with any matter of operational safety that is not in the Sierra Leone Civil Aviation Regulations, Part 13 - Aircraft Accidents and Incidents Investigation but expedient for public interest.
- 2.5.0.3 The Commissioner will issue Bulletins to provide guidance or safety information to the industry or require compliance with specific part of the Regulations.

2.5.1 DRAFTING AND ISSUING/AMENDING OF INVESTIGATION DIRECTIVE AND BULLETINS

- 2.5.1.1 The process starts with drafting of the Investigation Directive or Bulletin by the focal point.
- 2.5.1.2 The Focal Point will deliberate on the Investigation Directive and make appropriate recommendation to the Commissioner for issuing or amendment of the Investigation Directive in the format in Appendix R5.
- 2.5.1.3 The Focal Point should maintain a Master Inventory List of all Investigation Directives issued/amended by Bureau stating effective date, amended date, and cancelled date. Investigation Directive reference will carry the following format SL-AAIIB/ID/YYYY/NNN e.g. First Directive issued in year 2023 will be SL-AAIIB/ID/2023/001.
- 2.5.1.4 Bulletins will be drafted by relevant heads of divisions responsible for the relevant areas and issued by the Commissioner or on behalf of the Commissioner by the relevant heads of divisions. The Bulletins will not require any work from the Focal Point.

2.6 HANDLING ICAO STATE LETTERS

2.6.1 PURPOSE

This chapter describes the procedure adopted by the Sierra Leone Aircraft Accident and Incident Investigation Bureau for processing of ICAO State letters and handling of periodic reviews of the latest updates to relevant ICAO Standards and Recommended Practices (SARPs).



2.6.2 GENERAL

- 2.6.2.1 The Focal Point of the Sierra Leone Civil Aviation Authority (SLCAA) is responsible for receipt, monitoring and distribution of ICAO State Letters (SLs) to entities in Sierra Leone, including the Bureau. However, the Bureau's Focal Point is responsible for monitoring of ICAO State Letters on the ICAO secure portal.
- 2.6.2.2 The Commissioner will forward the SLs received from SLCAA to the Bureau's Focal Point.
- 2.6.2.3 The Bureau's Focal Point is designated to monitor ICAO State Letters and should monitor the ICAO website (portal.icao.int) for new amendments to the Annexes.
- 2.6.2.4 The Focal Point is responsible for coordinating and forwarding of the Bureau's technical response to ICAO on State letters.

2.6.3 ICAO STATE LETTERS PROCEDURE

2.6.3.1 Receipt of ICAO State Letters (SLs).

- 2.6.3.1.1 State Letters (SLs) are received from SLCAA via email and followed by letter to the office of the Commissioner.
- 2.6.3.1.2 Upon receipt of an ICAO State Letter, the Commissioner shall forward the ICAO State letter to the AIG Focal Point.
- 2.6.3.1.3 The Focal Point should keep a copy in the Rule making file.
Note: The above process may be an electronic process.

2.6.4 Processing of ICAO State Letters

- 2.6.4.1 The process of ICAO state letters by the Focal Point will depend on the content as follows:
- a) Informative letter. This letter will be only dispatched to the relevant heads of division for their significant information. The Rule making file established by the Focal Point shall be updated with an indication of date letter was dispatched and the officer(s) in receipt. The process will end at this step.
 - b) Letter requiring response (apart from Amendment Letters). Upon collation of inputs from concerned division and Agencies, the Focal Point shall put up a reply to ICAO for the Commissioner's signature on the relevant action taken by Sierra Leone in respect of the State letter. And copy the response to the Director General of the Sierra Leone Civil Aviation Authority.
 - c) Invitation letter to an ICAO event. Upon receipt of this letter, the Commissioner will designate participants to the ICAO event in accordance with ICAO State Letter notification procedure described in Chapter 3. The Rule making file shall be updated accordingly. The process will end at this step.
 - d) Amendment letter: Two cases are covered under this subject: ICAO proposed amendments and ICAO adopted amendment. Upon receipt of ICAO State Letter proposed and/or adopted letter from the SLCAA, the Commissioner will forward such letter to the Focal Point who should initiate a review with the relevant Heads of Division.



2.7 PROCESSING ICAO PROPOSALS ON AMENDMENTS TO ANNEXES

2.7.1 ICAO Proposed Amendment to Annexes

2.7.1.1 Preliminary Review

The Focal Point should in coordination with heads of Division initiate a preliminary review of ICAO proposed amendments in order to assess their impact on regulatory documents (SLCAR Part 13) and to identify concerned stakeholders before the proposed amendment are circulated to them as appropriate for comments taking into account the ICAO deadline for reply. Relevant stakeholders include the Sierra Leone Civil Aviation Authority, Airline operators, non-commercial aircraft operators, aircraft owners, aircraft maintenance organizations, flying clubs, approved aviation training organizations, Air Traffic Services providers, airport operators, ground handling service providers, aviation fuel suppliers, aviation related non-governmental organizations and aviation pressure groups.

2.7.1.2 Consultation with Stakeholders

The Focal Point should forward the ICAO State Letter containing the proposed amendment to the ICAO Annex 13 with Attachment of the proposed changes to the ICAO text using editorial practice showing deleted text with a line through it and new text highlighted with grey shading. for stakeholders' comment within a specified timeline, taking into account ICAO deadline for reply, through transmittal letter or email.

2.7.1.3 Final Review

Following receipt of comments from concerned stakeholders, the Focal Point in coordination with the Heads of Division should undertake a final review of the comments and establish a draft response of the Sierra Leone on the ICAO proposed amendments to the Annex and associated attachments.

2.7.1.4 Bureau's position on ICAO proposed amendment

Within one week from the final review, the Focal Point shall prepare the following:

- a) Reference to the origin and purpose of the proposed amendment;
- b) Summary of the main agreement or disagreement with ICAO proposed amendment and filing of ICAO response Form. A typical ICAO response form is usually attached to the ICAO State Letter.

2.7.1.5 Approval and Transmission to ICAO

The draft reply which reflects States' position on ICAO proposed amendment will be submitted to the Commissioner for approval. Once approved, the Focal Point should forward an electronic copy of the reply to the ICAO address indicated in the Sate Letter, not later than five days prior to the ICAO deadline and transmit a copy to the Sierra Leone Civil Aviation Authority (SLCAA).

2.7.1.6 Maintenance of Records in the Rule making File

The Focal Point is responsible to ensure filing and maintenance of records in the Rule making file relating to ICAO State Letters received and all materials produced during the stages of review of the ICAO State Letters on the proposed amendments to the Annex.



2.7.2 ICAO State Letter for Adoption of Amendment to the Annex

2.7.2.1 Preliminary Review

The Focal Point, with the support of relevant heads of division should carry out a preliminary review of ICAO State Letter on adoption of amendments to the Annex to identify final amendments introduced into the initial ICAO proposals on the subject matter. The Focal Point should establish a summary of the main changes with respect to the Bureau's initial position on the State Letter. The ICAO adopted amendment together with this summary shall be circulated to stakeholders as appropriate for their comment. These activities shall be performed within one week from the time of receiving the said ICAO State letter.

2.7.2.2 Consultation with Stakeholders

The Focal Point should forward the ICAO adopted amendment together with the summary of the Bureau's review to the stakeholders as appropriate for their comment within a specified timeline, taking into account ICAO deadline for reply.

2.7.2.3 Final Review

Following receipt of comments from concerned stakeholders, the Focal Point with the support of the relevant heads of Division should undertake a final review of the comments and establish a final position on the ICAO adopted amendments to the Annex and associated attachments. This draft should reproduce the comments received on the individual issues and should propose the course of action for each ICAO adopted provision. The final review document should indicate whether the ICAO adopted amendments are accepted with differences or not. In all cases, ICAO Form of Notification of Compliance with or without differences should be kept in file by the Focal Point. If the whole ICAO adopted amendment is not acceptable, the ICAO Notification of Disapproval Form be filled and enclosed to the final review document. The final review document shall be submitted to the Commissioner for approval. The final review period should not be more than Two weeks after the consultation period.

2.7.2.4 Comments received after final review

Comments received after the final review periods may not be considered. However, the Focal Point should analyse the reply. If there is a significant impact of ICAO adopted amendments on the activities of the Bureau or a particular stakeholder or group of stakeholders and foreseen difficulties for the implementation, the Focal Point should inform the Commissioner, who will decide on the course of action to be taken. These difficulties and the decision taken should be reflected in the final review document.

2.7.2.5 Approval and Transmission to ICAO

Once approved, the Focal Point should forward an electronic copy of this reply to the address indicated in the ICAO State Letter, not later than five days prior to the ICAO deadline and transmit a copy to Sierra Leone Civil Aviation Authority (SLCAA). The commissioner shall direct the focal point to initiate the amendment of any affected portion of the regulations to bring it into compliance with Annex 13 to the Chicago Convention. The amendment of the Sierra Leone Civil Aviation Regulations (SLCAR) Part 13, - Aircraft Accident and Incident Investigation shall follow the procedures in section 2.3 of this manual.

2.7.2.6 Maintenance of Records in File

The Focal Point is responsible to ensure filing and maintenance of records relating to ICAO State Letters received and all materials produced during the stages of review of the ICAO State Letters on the adoption of amendments to the Annex.



2.8 IDENTIFICATION AND NOTIFICATION OF DIFFERENCE TO ICAO

2.8.1 PURPOSE

- 2.8.1.1 This chapter provides direction and guidance on the determination and notification of differences and publication of significant differences.
- 2.8.1.2 Sections 2.8.4 to 2.8.5 provide the description of the systems to notify differences. It is intended to be used for instructions proposed for new and developmental investigators.
- 2.8.1.3 Section 2.8.6 contains the procedure to be used by the Bureau's personnel on the identification and notification of differences.
- 2.8.1.4 Section 2.8.7 contains the procedure to be used by Bureau's personnel on the determination and publication of significant differences.

2.8.2 INTERNATIONAL OBLIGATIONS AND REQUIREMENTS RELATED TO DIFFERENCES

2.8.2.1 General

- 2.8.2.1.1 Article 1 of the Convention on International Civil Aviation (Chicago Convention) underlines that each State has complete and exclusive sovereignty over the airspace above its territory.
- 2.8.2.1.2 In accordance with Article 37 of the Chicago Convention, States undertake to collaborate in securing the highest practicable degree of uniformity in all matters in which such uniformity facilitates and improves air navigation.
- 2.8.2.1.3 To this end, the International Civil Aviation Organization (ICAO) adopts and amends from time to time, as may be necessary, International Standards and Recommended Practices (SARPs) and procedures dealing with matters concerned with safety, regularity and efficiency of air navigation.
- 2.8.2.1.4 The original A1-31 definition stated that uniform application by Contracting States of the specifications contained in the international standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the recommended practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation.
- 2.8.2.1.5 While the implementation of Standards is considered, by definition, as necessary, the Chicago Convention also recognizes, through Article 38, that there are instances when this is impracticable, or it is necessary to adopt regulations or practices differing from those established by Standards.
- 2.8.2.1.6 In accordance with Article 38, a contracting State must notify ICAO any time it does not comply with a Standard in all respects; does not bring its regulations or practices into full accord with any Standard; or adopts regulations or practices differing in any particular respect from the Standard.
- 2.8.2.1.7 The following provides a non-exhaustive list of scenarios that present circumstances requiring the notification of a difference:
 - a) A situation in which the State does not bring its practices into full accord with the Standard. For example, when a Contracting State has incorporated a Standard into its national regulations but has only partially implemented or applied it in practice.



- b) A situation in which the State's regulation (or lack thereof) differs from the Standard. For example, when a State applies a Standard in practice, but has not incorporated it into its national regulations.
- c) A situation in which the State does not comply with a Standard in all respects. For example, when a State has not incorporated a Standard into its national regulations and not implemented or applied it in practice.

2.8.2.1.8 It should be noted that the notification of Differences does not relieve a State of its obligations as per the Chicago Convention.

2.8.2.1.9 The purpose of the publication of significant differences in the AIP is, primarily, to provide flight crews, and other stakeholders, with information which is essential to international operations, and which is not readily available.

2.8.3 PURPOSE AND BENEFITS OF NOTIFYING DIFFERENCES

2.8.3.1 The primary purpose of notifying differences is to promote safety, security, efficiency and regularity in air navigation by ensuring that all stakeholders, concerned with international civil aviation are aware of all national rules and practices in so far as they differ from those prescribed in SARPs. Therefore, lack of information on differences creates uncertainty and poses a potential hazard to the safety, regularity and efficiency of air navigation.

2.8.3.2 Dissemination of differences enhances transparency of safety information, and, consequently, facilitates States' decisions to accept or not accept other States' aircraft and operators, specifically within the context of the management of safety. Incorrect notification of differences may also potentially lead to misunderstandings and could result in undesirable operational situations, or in other potential negative consequences in terms of recognition of certificates and licenses, ramp inspections, and ultimately traffic rights.

2.8.3.3 The notification of differences is therefore an important and useful factor that contributes to ensuring the safe and orderly growth of international civil aviation.

2.8.4 GENERAL GUIDELINES ON THE IDENTIFICATION AND NOTIFICATION OF DIFFERENCES

2.8.4.1 Annex Components to which the Notification of Differences Process apply

2.8.4.1.2 The forward to the Annexes describes the components that are considered as material comprising Annex proper. The application of the difference process to these are as follows:

- a) Standard. Any specification for physical characteristics, configuration, materiel, performance, personnel or procedures, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38.
- b) Recommended Practice. Any specification for physical characteristics, configuration, materiel, performance, personnel or procedures, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention; in the event of impossibility of compliance notification to the Council is encouraged under Assembly Resolutions.
- c) Appendices. Material grouped separately for convenience but forming part of the SARPs adopted by the Council. The notification of differences therefore applies to appendices. In order to file a difference



against an appendix, States should file a difference against the SARPs, if any that makes reference to the Appendix.

- d) Definitions. These do not have independent status but are an essential part of each SARPs in which the term is used, since a change in the meaning of the term would affect the specification. Therefore, differences against definitions should be notified. Once a difference against a definition has been notified, differences against the SARPs using that definition should be notified as well. Therefore, the attention of Contracting State is drawn to the possible far-reaching consequences of deciding to adopt a definition differing in substance from an Annex definition.
- e) Tables and figures. These add to or illustrate a SARPs and which are referred to in an Annex, form part of the associated SARPs and have the same status. The notification of differences therefore applies to such tables and figures. In order to file a difference against a table or figure, States should file a difference against the SARPs that makes reference to the table or figure.
- f) Not Applicable SARPs. While most SARPs are applicable to all States, some SARPs may only apply to some States. For instance, Annex 3 contains provisions which apply only to States which have accepted the responsibility for providing a world area forecast center (WAFC) within the framework of the world area forecast system. Likewise, Annex 8 contains provisions which apply to the State of Design of a particular aircraft type. In such cases, States do not have to notify differences against that SARPs which is not applicable to them.

2.8.4.1.3 The notification of differences process does not apply to Forewords, Introductions, Notes and Attachments.

2.8.4.2 General guidelines regarding the determination of Differences

2.8.4.2.1 When determining whether a difference against a SARPs exists, the State should assess to what extent the conditions in Articles 38 are met. To this end, the following should be considered.

2.8.4.2.2 Compliance with SARPs may be regarded, in general, as having two main characteristics. The first comprises the administrative arrangements necessary to bring the ICAO requirements into force nationally; the second consists of the practical arrangements necessary, such as the provision of facilities, personnel, equipment, guidance, enforcement mechanisms etc.

2.8.4.2.3 Therefore, Standard implementation, in general, can only be considered satisfactory when suitable administrative and practical arrangements exist. For instance, when an administrative arrangement, bringing the regulation into force, is in place but not applied in practice, or when no suitable administrative arrangement exists even though some corresponding Standard until compliance is achieved.

2.8.4.2.4 Implementation of Recommended Practices is recognized as desirable in the interest of safety, regularity or efficiency. If a State chooses to implement a particular Recommended Practice, it should have a requirement with sufficient administrative force. For instance, Annex 10, Volume I, recommended practice 2.1.4.2 states: "Recommendation. A State that approves GNSS-based operations should ensure that GNSS data relevant to those operations are recorded". If a State decides to implement this Recommended Practice, it should issue a national requirement in order to ensure that GNSS-based operations data are recorded.

2.8.4.2.5 Therefore, if a State has determined that it has implemented the SARPs through sufficiently robust administrative arrangements (such as regulations, or other documents carrying sufficient administrative force), and that those arrangements are enforced and implemented, the State does not need to notify ICAO of any differences since it "complies in all respects" with the ICAO requirement and has brought its "regulations and practices" into full accord with it.

2.8.4.2.6 The ICAO Council, on 13 April 1948 adopted a resolution inviting the attention of Contracting States to the desirability of using in their own national regulations, as far as practicable, the precise language of



those Standards that are of a regulatory character. In this regard, it should be noted that close adherence of a national regulation to the wording of SARPs be supported by effective enforcement mechanisms and rigorous implementation monitoring.

2.8.4.2.7 The determination of differences should be performed by the State regulatory authorities and in keeping with the State commitment, as a Contracting State, to comply with the Convention.

2.8.4.3 Categories and descriptions of Differences

2.8.4.3.1 Categories of Differences.

As notifications of differences may correspond to different scenarios, the following categories of differences are provided as a guide in determining whether a difference in the context of Article 38 exists:

- (a) A Contracting State's requirement is more exacting or exceeds SARPs. This category applies when the national regulation and practices are more demanding than the corresponding SARPs, or impose an obligation within the scope of the Annex which is not covered by the SARPs. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;
- (b) A Contracting State's requirement is different in character or other means of compliance. This category applies when national regulation and practices are different in character from the corresponding SARPs, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation. The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieves, by other means, the same objective as that of the corresponding ICAO SARPs and so cannot be classified under a) or c); and
- (c) A Contracting State's requirement is less protective or partially implemented/not implemented. This category applies when the national regulation and practices are less protective than the corresponding SARPs; when no national regulation has been promulgated to address the corresponding SARPs, in whole or in part; or when the Contracting State has failed to bring its practices into full accord with the corresponding SARPs.

2.8.4.3.2 Description of Differences

Differences in substance should be described clearly and concisely and should allow the reader to easily grasp the scope of the differences. In general, the description should not be a copy of the national requirement, leaving it up to the reader to identify the differences against the ICAO requirement, but rather a description of the variances.

2.8.4.4 Notification of Differences

2.8.4.4.1 When to Notify Differences:

- a) ICAO informs Contracting States and international organizations, by State letter, of the adoption of the amendment and requests for notification of any disapproval, and differences, before given dates.
- b) In accordance with Article 90 of the Chicago Convention the amendment will become effective three months after the issuance of the State Letter, except for any part thereof for which a majority of the Contracting States have registered their disapproval with the Council.



- c) Amendments, or such parts thereof as have become effective, will become applicable on a given date set by the Council. States are expected to comply with and implement all parts of the amendment that are applicable to them.
- d) States are advised, by ICAO electronic bulletin, as soon as amendments have become effective. States are encouraged, however, not to wait until then to start preparing for implementation of the amendment, and notification of differences.
- e) The Council defines the date by which Contracting States are requested to notify ICAO of the differences between its national regulations or practices (Resolution of Adoption).
- f) States are requested to provide updates of the differences previously notified after each amendment, as appropriate, until the difference no longer exists.

2.8.4.4.2 Means of Notification

- 2.8.4.4.2.1 Differences can be notified by sending to ICAO a Form on Notification of Compliance with Differences (paper-based process); or through the Electronic Filing of Differences (EFOD) system at www.icao.int/usoap online framework (OLF) platform.
- 2.8.4.4.2.2 The EFOD system, launched on 1 April 2011, is a web-based tool that allows Contracting States to notify differences Information and facilitates the sharing of information between States through ICAO. Once completed, the EFOD system gives States personnel convenient access to a repository of compliance and difference information, which have been previously entered. The system also provides additional information and functionality such as latest ICAO provisions for which a re-filing of differences is required, remarks which can help State staff in managing compliance with individual SARPs and in passing on knowledge to incoming staff, statistical data which provides a “big picture” overview of the situation in the State, and differences information from other States.
- 2.8.4.4.2.3 While the paper-based process employing the Form on Notification of Compliance with or Differences is still the primary means, Contracting States have been encouraged to transition to using the EFOD system in order to address issues associated with the timeliness of the notification and/or dissemination of differences, as provided in Article 38 of the Chicago Convention.

2.8.5 GENERAL GUIDELINES ON THE IDENTIFICATION AND PUBLICATION OF SIGNIFICANT DIFFERENCES

2.8.5.1 Notification of Differences in the Aeronautical Information Publication (AIP)

- 2.8.5.1.1 The primary purpose of reporting Differences is to promote safety and efficiency in air navigation by ensuring that governmental and other agencies, including operators, concerned with international civil aviation are made aware of all national rules and practices in so far as they differ from those prescribed in the ICAO Annexes, Procedures for Air Navigation Services (PANS) and Regional Supplementary Procedures (SUPPS). If identified in AIP, significant Differences would not only provide a clear picture of the operational significance of the Differences to users of that document but facilitate the process of isolating and eliminating those that do not have an important bearing on the safety of air navigation or are inconsistent with the objectives of the ICAO provisions.
- 2.8.5.1.2 Annex 15 requires that a Contracting State record in its AIP any significant Differences between its national regulations and practices and the related ICAO provisions. It is intended that any such Differences be included in GEN 1.7 of the AIP. This is to ensure that an AIP will provide up-to-date information on the status of implementation of Standards, Recommended Practices and Procedures (SARPs), particularly those concerned with aircraft operations and the provision of facilities and services. Any deviation from SARPs that needs to be taken into account in aircraft operations, as indicated below, constitutes a “significant difference”.



- 2.8.5.1.3 All significant differences notified to ICAO must also be included in the AIP in a form that will enable a user to differentiate easily between the national rules and practices of a State and the related ICAO provisions. They comprise Differences from:
- a) Any of the International Standards;
 - b) Recommended Practices that are important for the safety of air navigation or, in the case of facilitation, for the speedy handling and clearance through customs, immigration, etc. of aircraft and the loads they carry;
 - c) Procedures for Air Navigation Services (PANS) that are important for the safety of air navigation; and
 - d) Regional Supplementary Procedures (SUPPS) that are important for the safety of air navigation.
- 2.8.5.1.4 It therefore follows that all the provisions in ICAO Annexes that are Standards are significant, and that any Differences between the national regulations or practices of a State and the related ICAO Standards are Differences which must be notified. This is an obligation which originates from Article 38 of the Convention. In the matter of Recommended Practices, only those Differences that are important for the safety of air navigation or, in the case of facilitation, to the speedy handling and clearance through customs, immigration, etc. of aircraft and their loads are significant. Because of their nature, most of the Recommended Practices in ICAO Annexes contribute to the safety of air navigation.
- 2.8.5.1.5 Differences from the PANS-ABC (Doc 8400) would not constitute “significant” differences. However, Annex 15, Appendix 1, GEN 2.2 requires the inclusion, in the AIP, of a list of the abbreviations and their respective significations used by the State in its AIP and in the distribution of aeronautical information. In this list any abbreviation or signification that differs from the corresponding ICAO abbreviation or signification must be suitably annotated. The remainder of Doc 8400 contains signals, designations and codes which are universally applied.
- 2.8.5.1.6 In general, notification of Significant Differences will be limited to cases where the national regulations or national practices of a State differ from the ICAO Standards, Recommended Practices and Procedures. When national regulations or practices are essentially the same as the ICAO provisions but are not identical or are in compliance with the ICAO provisions but individual differences exist at particular sites, no Difference should be reported since the details of the procedures and facilities existing are the subject of notification through the medium of the AIP. Broadly, the determination should be based on the following criteria, in terms of whether knowledge of the Differences is necessary for the safety of international air navigation:
- a) Does the Difference impose an obligation?
 - i. Within the scope of the relevant Annex, which is not covered by an ICAO provision; or
 - ii. Different in character from that of the corresponding ICAO provision;
 - b) Is the applicable national regulation or practice more exacting or less protective than the corresponding ICAO provision.
 - c) When national regulations or practices are more stringent than the ICAO provisions, no “Differences” should be notified, since the State’s AIP should reflect the actual situation. Similar action should be taken in respect of procedures which have not been disapproved by the State but either have not yet been implemented or are being gradually implemented.
- 2.8.5.1.7 In the notification of a Difference, it is necessary to make an explicit statement of intent to comply where such intent exists, or where such is not the intent, of the Difference or Differences that will exist. This statement should be made with respect to the whole of the ICAO Annex or document concerned, i.e. including any associated amendments, and should be with regard to existing as well as new installations. Additionally, where the intention is to comply, an indication should be given in general terms if, for a certain period, there will be cases where facilities will not be provided in accordance with the provisions of an Annex but without giving details of such Differences since this will be a matter for notification



through the AIP. Where an alternative course of action is provided for in the SARPs, the choice made should be indicated.

2.8.5.1.8 The reporting of Differences to Annexes such as Annex 11, which deals with the provision of air traffic services, can only be determined by the State concerned, although the recommendations of Regional Air navigation Meetings will provide considerable assistance. In the case of Annex 11, Differences will generally fall under two main headings:

- (a) The non-adoption of procedures for air traffic services contained in the Annex; and
- (b) The non-provision of facilities for air traffic services; although in this Annex the division between facilities and procedures is less distinct than in others. Differences under a) are likely to be more numerous than those under b).

2.8.5.1.9 In so far as (b) — the non-provision of facilities — is concerned, this is likely to become a question of whether or not the physical equipment specified in the Annex is provided. In practice, the most common cases of “non-provision” are likely to be in respect of the communication and recording equipment necessary to meet the specifications of Annex 11, Chapter 6.

2.8.5.1.10 In the case of Annex 3, there would be a notifiable difference if available meteorological information for departing aircraft and for arriving aircraft were observed, computed or presented in a manner that differs substantially from the provisions of the Annex (Without the non-standard nature of the meteorological information being known to the pilot). For example, according to 4.7.13 of Annex 3, any observed runway visual range value which does not fit the reporting scale in use should be “rounded down to the nearest lower step in the scale”; similarly, according to 4.11.4 and 4.11.5, QNH or QFE values should be “rounded down to the nearest lower whole hector pascal”. Any rounding up of such values to a higher value, or provision of units different from the hector pascal, would result in non-standard, and possibly misleading, data and should be notified. Such cases, however, are understood to be very rare. In most cases, an AIP should and generally does show which of the alternative formats, methods and means for providing meteorological information that are foreseen in Annex 3 have been chosen and are applied by the State. For example, an AIP should indicate which of the different kinds of flight documentation set out in Annex 3, Chapter 9, are available as well as the procedures and means used for providing them to operators or flight crew members.

2.8.6 PROCESS AND PROCEDURES FOR MANAGEMENT OF DIFFERENCES

2.8.6.1 General

2.8.6.1.1 In order to keep the status of Differences up-to-date, the Bureau is properly organized and staffed with qualified personnel capable of accomplishing these tasks.

2.8.6.1.2 Determination of Differences, their clear and concise description and notification require a good knowledge and understanding of:

- (a) the ICAO expectations, templates and tools regarding notification of differences.; and
- (b) the national regulatory context and the corresponding SARPs.

2.8.6.1.3 Ideally, when national regulations are drafted, Focal Point should keep in mind that Differences will have to be determined and notified at some point, if applicable. The Focal Point has to identify and formulate Differences in coordination with heads of division when the national rules are being drafted, since the level of compliance with or departure from SARPs should be especially easy to identify at that time. Such an approach has proven to facilitate notification of differences.



2.8.6.1.4 As previously stated, the degree or alignment, or non-alignment, of national regulations with ICAO SARPs may significantly influence the complexity of the determination and formulation of differences. While notification of Differences may be perceived as a tedious task, it represents only a fraction of the work and time needed for implementing SARPs (drafting of national rules and associated material, information of regulated entities, enforcement of rules etc.).

2.8.6.1.5 Any Difference from SARPs needs to be identified and notified. For a Contracting State to fulfil this obligation, it is clear that an appropriately organized and effective procedure must be established on the basis of national regulations, and structured to effectively fulfil the tasks that it is expected to undertake.

2.8.6.2 **Identification of Differences and significant Differences.**

The identification of Differences and significant Differences and will take place in two different moments:

- (a) Treatment of a State Letter after the adoptions of an ICAO Amendment/new Annex;
- (b) Development of new or revised regulations related to an existing Annex.

2.8.6.2.1 **New or Revised Rules for an Existing Annex**

2.8.6.2.1.1 Upon completion of the rule making process described in section 2.3.2 above resulting into promulgation of new or amended regulations, the Focal Point in coordination with heads of division should subject the provisions of the new or amended regulations in comparison with the provisions of the latest amendment of Annex 13. This is done using the Compliance Checklist (CC)/Electronic Fling of Differences (EFOD) on the ICAO OLF (Online Framework).

Note: The Focal Point should export CC/EFOD from the OLF website.

2.8.6.2.1.2 The result of the filing of the CC/EFOD should indicate at appropriate column (refer to 2.8.4.3 above) whether there is Difference or no difference exist with Annex 13 provision.

2.8.6.2.1.3 Once it is determined that a Difference exist between a new/revised the regulations and any provision of Annex 13 the Focal Point must notify ICAO by uploading the CC/EFOD on the OLF.

2.8.6.2.1.4 The notification must include, at a minimum:

- (a) The number of the paragraph or subparagraph as amended which contains the SARPs to which the Difference relates;
- (b) Category of the Differences (see paragraph 2.8.4.3) and if it is a significant difference;
- (c) The reasons for the Difference why Sierra Leone does not comply with the SARPs, or considers it necessary to adopt different regulations or practices;
- (d) A clear and concise description of the Difference; and
- (e) Intentions for future compliance and any date by which Sierra Leone plans to confirm compliance with and remove its difference from the SARPs for which the differences have been notified.

2.8.6.2.1.5 The Focal Point in coordination with heads of division will conduct a review of the package for accuracy, justification and completeness and will then forward the package to the Commissioner for approval.



2.8.6.2.1.6 If it is found that no equivalent regulations exist in the national regulation, the Focal Point should follow the procedure established in Section 2.3, subsection 2.3.2 and prepare a proposal for amendment of the Regulation.

2.8.6.3 Notification of Differences.

2.8.6.3.1 Once a Difference is approved, the AIG Focal Point should import the CC/EFOD on the OLF and validate the Differences.

Note: Sierra Leone validates both standards and recommendations.

2.8.6.3.1.2 After the validation of the Differences the AIG Focal Point should generate from the OLF an E-Supplement for the entire Annex.

2.8.6.3.1.3 The E-Supplement should be published on the Bureau’s official website.

2.8.7 PROCESS AND PROCEDURES FOR MANAGEMENT OF SIGNIFICANT DIFFERENCES

2.8.7.1 Significant Differences are those Differences that are not only materially different from the ICAO SARPs but also may significantly impact on the affected aviation activity with or without consequent safety risk implications.

2.8.7.2 The Focal Point in coordination with the relevant Heads of Division should analyse each of the Differences identified in Section 2.8.6 using the Risk Management Process approach described in the following paragraphs to determine if any significant difference exist.

2.8.7.3 First step is to determine the Safety Risk Probability: Probability is defined as the likelihood or frequency that a safety consequence or outcome might occur, that is what is the chance that the difference identified can lead to significant impact on the affected aviation activity. The rating of the safety risk probability can be assigned a value according to the table 1 below:

Table 1: Probability

Likelihood	Meaning	Value
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

2.8.7.4 Determine the Safety Risk Severity: Severity is defined as the extent of harm that might reasonably occur as a consequence or outcome of the identified hazard. In other words what is the resultant harm identified difference can cause to the affected aviation activities? The rating of the safety risk severity can be assigned a value according to the table 2 below:



Table 2: Severity

Severity	Meaning	Value
Catastrophic	<ul style="list-style-type: none"> — Equipment destroyed — Multiple deaths 	A
Hazardous	<ul style="list-style-type: none"> — A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely — Serious injury — Major equipment damage 	B
Major	<ul style="list-style-type: none"> — A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency — Serious incident — Injury to persons 	C
Minor	<ul style="list-style-type: none"> — Nuisance — Operating limitations — Use of emergency procedures — Minor incident 	D
Negligible	<ul style="list-style-type: none"> — Few consequences 	E

2.8.7.5 Third step is to calculate Safety Risk Index using the Safety Risk Assessment Matrix: After assigning values to the safety risk probability and the safety risk severity, the matrix in table 3 below should be used to assign an assessment value to the safety risk.

Table 3: Safety Risk Assessment Matrix

RISK PROBABILITY	SEVERITY				
	5A	5B	5C	5D	5E
Frequent	5A	5B	5C	5D	5E
Occasional	4A	4B	4C	4D	4E
Remote	3A	3B	3C	3D	3E
Improbable	2A	2B	2C	2D	2E
Extremely improbable	1A	1B	1C	1D	1E

2.8.7.6 Fourth step is to determine Safety Risk Tolerability: The index obtained from the safety risk assessment matrix must then be exported to the safety risk tolerability matrix (see Table 4) that describes the recommended action for each index.

Table 4: Safety Risk Tolerability Matrix

Tolerability Description	Assessed Risk Index Range	Description	Suggested Criteria	Recommended Action



INTOLERABLE REGION	5A, 5B, 5C, 4A, 4B, 3A	High risk	Unacceptable under the existing circumstance	Cease or cut back operation promptly if necessary. Perform priority risk mitigation to ensure that additional or enhanced preventive controls are put in place to bring down the risk index to the moderate or low range. The Difference must be classified as Significant Difference and must be published in the AIP.
TOLERABLE REGION	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Moderate risk	Acceptable based on risk mitigation. It may require management decision.	Schedule performance of a safety assessment to bring down the risk index to the low range if viable. Commissioner must approve the publication of the Difference in the AIP.
ACCEPTABLE REGION	3E, 2D, 2E, 1B, 1C, 1D, 1E	Low risk	Acceptable	Acceptable as is. No further risk mitigation required. The Difference is not a Significant Difference and is not required to be published in the AIP.

- 2.8.7.7 If the assessment of the Tolerability Index of the Identified Difference falls in the intolerable region, then that difference is classified as a Significant Difference.
- 2.8.7.8 There after the Focal Point should forward the result of the assessment to the Commissioner and obtain approval to transmit it to the SLCAA for publication in the AIP.
- 2.8.7.9 The Focal Point should keep records of these activities in file including an extract of the relevant portion of the AIP.



CHAPTER 3 - INVESTIGATION OBJECTIVE AND INDEPENDENCE

3.1 ICAO REQUIREMENTS

3.1.1 According to ICAO Annex 13, an accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. It must also be able to conduct investigations in an independent manner that precludes interference from outside pressures. The following references are relevant:

- a) ICAO Annex 13, Chapter 3, paragraph 3.1:
“The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability.”
- b) ICAO Annex 13, Chapter 5, paragraph 5.4:
“The accident investigation authority shall have independence in the conduct of the investigation and have unrestricted authority over its conduct...”
- c) ICAO Annex 13, Chapter 5, paragraph 5.4.1:
“Any investigation conducted in accordance with the provisions of this Annex shall be separate from any judicial or administrative proceedings to apportion blame or liability.
Note: Separation can be achieved by the investigation being conducted by State accident investigation authority experts, and any judicial or administrative proceedings being conducted by other appropriate experts. Coordination, as per 5.10, between the two processes would likely be required at the accident site and in the gathering of factual information, with due consideration to the provisions in 5.12.”
- d) In accordance with ICAO Annex 13, Chapter 5, paragraph 5.4.3:
“A State should ensure that any investigations conducted under the provisions of this Annex have unrestricted access to all evidential material without delay and are not impeded by administrative or judicial investigations or proceedings.
Note: The intent of this recommended practice may be achieved through legislation, protocols, or agreements between the accident investigation authorities and the judicial authorities.”
- e) ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part I — Organization and Planning, paragraphs 2.1.7, which states, in part, the following:

“The accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. It should be established in such a way that it can withstand political or other interference or pressure from other government organizations, as well as from industry. Many States have achieved this objective by setting up their accident investigation authority as an independent statutory body or by establishing an accident investigation organization that is separate from the civil aviation administration.”



In Sierra Leone, the accident investigation authority reports directly to the President through the Minister responsible for Transport and Aviation.

- 3.1.2 Sierra Leone has achieved this objective by the establishment of a Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB) as an independent statutory body that is separate from the Sierra Leone Civil Aviation Authority (SLCAA) and other entities that could interfere with the conduct or objectivity of an investigation. The Bureau reports directly to the President through the Minister responsible for Transport and Aviation.

3.2 INDEPENDENCE OF THE BUREAU

- 3.2.1 Maintaining independence in the conduct of investigations will result in enhancing the credibility of the Bureau and its ability to avoid situations that have the potential to create conflicts of interest. Maintaining independence of the investigation function is equally important for accident and incident investigations.
- 3.2.2 The intent of “independence” is that the Bureau shall be functionally independent, in particular of the Sierra Leone Civil Aviation Authority, which is responsible for airworthiness, certification, flight operation, maintenance, licensing, air traffic control or airport operation and, in general, of any other party whose interests could conflict with the task entrusted to the Bureau.
- 3.2.3 “Independence” does not mean that the Bureau would not be administratively supervised and accountable to a governmental minister or ministry (or parliament) for its finances, administration, policies and working methods (which should be transparent).
- 3.2.4 Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations. Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations have provided for the independent funding, staffing, autonomy and independence of the Bureau to discharge its investigation functions without conflict of interest or interference from outside pressure. Accordingly, the Bureau shall not be perceived to be influenced by the supervisory ministry or any authority on the conduct of investigations, the issuance of findings, safety recommendations, preliminary report(s) and the Final Report. The Bureau shall neither take nor seek instructions from other authorities and shall have unrestricted authority over the conduct of investigations. Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations provided to the Bureau the legislative support to ensure funding for its routine investigation activities with contingency plans in place for emergency funding of costly investigations.



3.3 THE REQUIREMENTS IN SIERRA LEONE

- 3.3.1 The Sierra Leone legislation, regulations, policies, and procedures are consistent with and reinforce the provisions of ICAO Annex 13 regarding the objective and independence of the investigation.
- 3.3.2 The requirements of the Bureau are contained Section 75(1); section 76(1); section 85; section 75(1) (c),(d), and (e); and section 78 (1)(2) and (3) of the Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations for the autonomy, funding, staffing, independence and objectivity of investigations, as follows:
- a) ensure the establishment of an adequately funded, professionally trained, independent and impartial aircraft accident investigative body in Sierra Leone;
 - b) ensure the independence of all investigations into aircraft accidents and incidents that are carried out in Sierra Leone, from political or other interference or pressure; and
 - c) promote the use of a common set of regulations compliant with the provisions of ICAO Annex 13 Aircraft Accident and Incident Investigation, including regulations for the protection of safety data with the purpose of accident prevention and not the assignment of blame.

3.4 ORGANIZATIONAL STRUCTURE OF THE BUREAU

CIVIL AVIATION STATE ORGANOGRAM

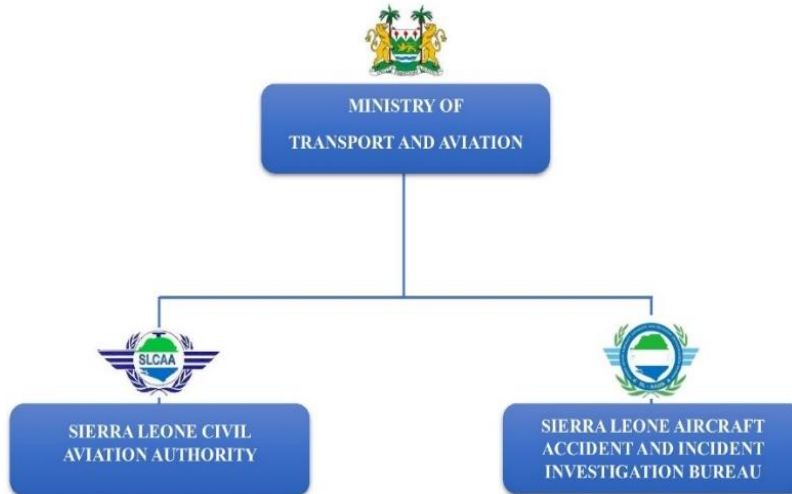


Figure 3-4-1: Civil Aviation State Organogram

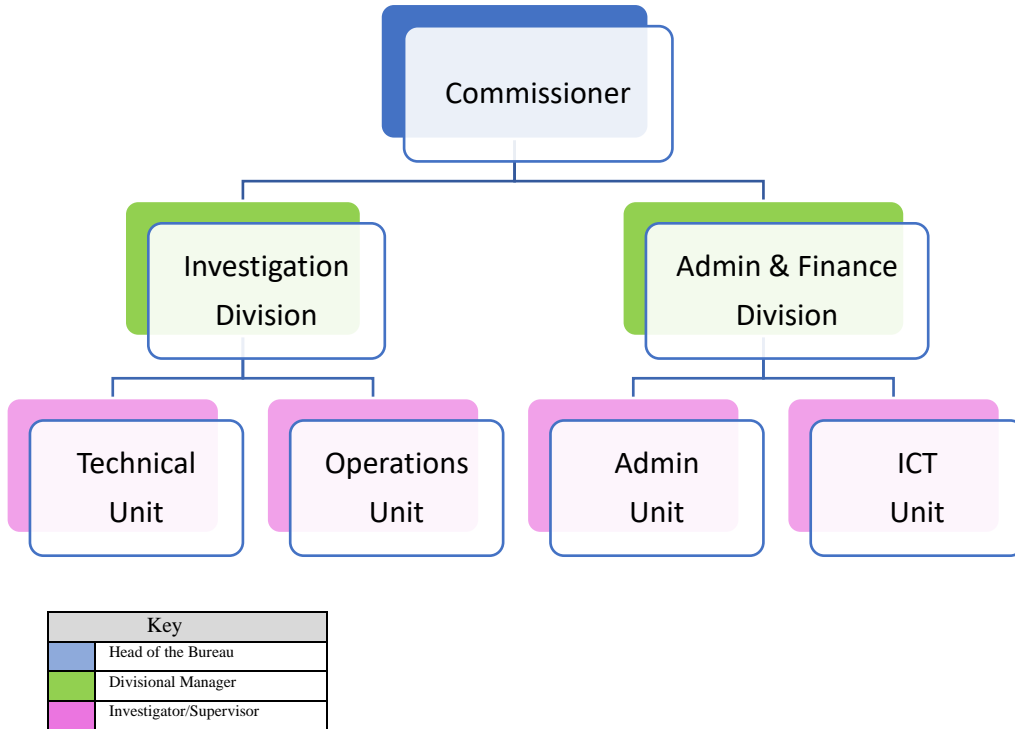


Figure 3-4-2: SL-AAIIB Organizational Structure.

3.4.1 Structure of the Bureau

- 3.4.1.1 This SL-AAIIB Staff Terms and Conditions of Service establishes an Organizational Structure which reflects the operations of the Bureau. The Bureau is comprised of the Office of the Commissioner, Investigation Division and Admin and Finance Division.
- 3.4.1.2 The SL-AAIIB is headed by the Commissioner who oversees the day-to-day activities of the Bureau including Public Relations. The Bureau comprises the following Divisions: Investigation Division and Admin & Finance Division.
- 3.4.1.3 The Investigation Division of the Bureau is headed by an Investigation Manager who reports directly to the Commissioner. It comprises of two (2) units namely: the Technical and Operations. The Technical Unit comprises of the head, investigators and trainee investigators. The Operations unit comprises of the head, technical officers and other investigation support specialties.
- 3.4.1.4 The Admin & Finance Division is headed by a manager who reports directly to the Commissioner. It comprises of an Admin Unit and an ICT Unit.



3.4.2 Duties and Responsibilities

3.4.2.1 Duties of the Office of the Commissioner

3.4.2.1.1 Duties of the Commissioner

The Commissioner is the head of the Bureau, who is appointed by the President through the Recommendation of the Minister responsible for Transport and Aviation, and reports to the President through the Minister. The commissioner oversees the day-to-day activities of the Bureau and supported by the two Divisional Managers.

3.4.2.1.2 Admin and Finance Division

The Admin and Finance Division comprises two (2) units: Admin and Information Communication Technology. The Division is responsible to facilitate the provision of sustainable resources (finance, human and technology) to the Bureau for the effective execution of activities, critical to enhancing aviation safety as set out in the various government policy documents and ICAO Safety and Recommended Practices (SARPs).

3.4.2.1.3 Duties of the ICT Unit

The ICT Officer is the Head of the ICT Unit of the Bureau that is in charge of all ICT Services, equipment, resources and related matters, including the handling of safety data, database, intranet and server, audio visual and imagery productions, internet and website services, general designs, social media publications and monitoring.

3.4.2.1.4 Investigation Division

The Investigation Division of the Bureau is headed by a manager who reports directly to the Commissioner. It comprises of two (2) units namely: the Technical and Operations. The Technical Unit comprises of investigators and trainee/developmental investigators in relevant specialties. The operations unit comprises of Technical Officers in related specialties.

3.4.2.2 Duties of the Investigation Division

The Investigation Division Manager reports directly to the Commissioner and is responsible for the overall administration of the Investigation division, including effective and efficient conduct of aircraft accident and incident investigations, handling investigators' training matters, developing investigation policies and procedures, safety data analysis and related matters.

The investigation division is subdivided into the Technical and Operations Units with their clear duties and responsibilities.

Note: At the moment the Bureau is not in a position to conduct full Annex 13 Investigations of accidents and serious incidents. However, the Bureau has signed agreements with Nigeria for delegation of part or whole of the investigation of accidents and serious incidents as the case may be. The Bureau's technical personnel will participate in the investigation as observers for training purposes. The roles of the Bureau's



personnel will be limited to initial notification to other relevant States, coordination, supervision, documenting and securing of evidential materials at the occurrence site pending arrival of the investigators.

3.4.2.2.1 Duties of the Technical Unit

The technical unit is headed by a investigator and reports to the Manager Investigation Division. The unit is responsible for ensuring conduct of aircraft accident and incident investigation and related matters as described in appendix 2 of the staff terms and conditions of service of the Bureau.

3.4.2.2.2 Duties of the Operations Unit

The Operations unit is headed by an investigator and reports to the Manager Investigation Division. The unit is responsible for assisting in developing, review and amendment of technical manuals and guidance materials. The unit also provide support functions in the conduct of aircraft accident and incident investigation and related matters as described in appendix 2 of the staff terms and conditions of service of the Bureau.

3.4.3 Vision and Mission Statements

3.4.3.1 Vision

To be an exceptional accident and incident Investigation functionary by preventing occurrences to improve aviation safety.

3.4.3.2 Mission

To strengthen aviation safety by resolving deficiencies through investigation in a timely manner using competent professionals.

3.4.4 Overview of the Bureau

3.4.4.1 The Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB) was established by Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations section 74(1). Its primary function is to improve aviation safety. It does this by investigating civil aviation occurrences within Sierra Leone territory in order to identify and communicate factors that affect, or might affect aviation safety. At the moment the Bureau is not in a position to conduct full Annex 13 Investigations of accidents and serious incidents.

However, the Bureau has signed MoU with the SLCAA for secondment of qualified staff when the need arises. The Bureau has also signed MoU with the Nigerian Safety Investigation Bureau (NSIB) and BAGAIA for the delegation of part or whole of the investigation of accidents and serious incidents as the case may be, and other stakeholders in aviation to carry out its investigation duties.



3.4.4.2 The Act makes it clear that, in carrying out its purpose, the Bureau cannot apportion blame, assist in determining liabilities or, as a general rule, assist in court proceedings. Its sole focus remains the prevention of future accidents and the improvement of safety.

3.4.4.3 The Bureau is entirely separate and independent from the aviation regulator (SLCAA), judicial authorities, policy makers and service providers. It remains administratively and financially accountable to the Ministry of Transport and Aviation.

3.4.4.4 In order to cultivate a strong reporting culture within the industry, the Bureau promotes an appropriate level of confidentiality and protection for sensitive safety information provided to it in the course of its work.

3.4.5 Objectives of the Bureau

3.4.5.1 The objective of the Bureau is the prevention of aircraft accident and incident and not to apportion blame or liability.

3.4.5.2 The fundamental objective of the Bureau is achieved through the following:

- a) Conducting thorough, impartial, systematic and timely investigations
- b) Identifying safety issues clearly and objectively without attributing blame or liability
- c) Ensuring the significance of causal and contributory factors is clearly understood by all concerned
- d) Promoting effective safety action
- e) Harnessing expertise and information necessary to its safety role
- f) Focusing its resources in the areas that are most likely to result in safety improvement

3.4.6 Purpose of the Bureau

3.4.6.1 The Bureau is an independent statutory agency of the Government of Sierra Leone established by the Civil Aviation Act of Sierra Leone Part IX – Aircraft Accidents and Incidents Investigations section 74(1), saddled with the responsibility of investigating air accidents and incidents, which fall within the jurisdiction and the responsibility of Sierra Leone in accordance with ICAO Annex 13.

3.4.6.2 In addition to the improvement of safety, its purpose includes gaining public confidence by:

- a) Ensuring that accidents are thoroughly and independently investigated and reports timely released to the public leading to preventive measures;
- b) Safety data recording, analysis and research; and
- c) Fostering safety awareness, knowledge and action.



3.4.6.3 Moreover, the Bureau was established in order to fulfill Sierra Leone's international obligations under Annex 13 of the Convention on International Aviation.

3.4.7 Functions of the Bureau

3.4.7.1 The Bureau performs its functions in accordance with the provisions of the Civil Aviation Act, regulations and, where applicable, relevant international agreements. It is responsible for investigating air accidents and incidents in Sierra Leone.

3.4.7.2 The key functions of the Bureau include but not limited to:

- (a) determination and classification of occurrences;
- (b) institute an investigation into the circumstances of a serious incident when the aircraft is of a maximum mass of over 2250kg and may delegate the whole or any part of the conduct of such investigation to another State or a regional accident and incident investigation organization by mutual arrangement and consent;
- (c) institute an investigation into the circumstances of the accident and be responsible for the conduct of the investigation and may delegate the whole or any part of the conduct of such investigation to another State or a regional accident and incident investigation organization by mutual arrangement and consent;
- (d) the gathering, recording and analysis of all relevant information on air safety data, in particular, for accident or incident prevention purposes, in so far as those functions do not affect its independence and entail no responsibility in regulatory, administrative or standard matters;
- (e) ensure due compliance with ICAO Annex 13 to the Chicago Convention and Protocols, Technical Instructions, Guidance and Procedures from the International Civil Aviation Organisation in respect of the investigation of aircraft accidents and incidents;
 - I. examine wreckage and conduct test of components;
 - II. conduct interviews take statements from witnesses and all such other persons as deemed fit.
- (f) coordinate and supervise all relevant agencies or parties to the investigation;
- (g) facilitate the exchange of knowledge, information, and relevant personnel of accident investigation agencies of ICAO and other Member States;
- (h) advise the Minister on all matters relating to civil aviation accident investigations and prevention;
- (i) create specialised divisions for the purpose of carrying out its functions;
- (j) visitation of the scene of the accident or incident;
- (k) preservation of the evidence;
- (l) if appropriate, the issuance of safety recommendations;
- (m) the conduct of safety studies in accident or incident scenarios, arising from observed trends and other safety related issues.



- (n) Establish and maintain a standard, hangars, office equipment, Investigators equipment, means of communication and transportation or such other facilities, necessary for the carrying out of its duties;
- (o) approve, design, and coordinate constant training for skills acquisition for staff of the Bureau in line with global development in aviation accident investigation and prevention;
- (p) undertake all such activities or actions relevant, or related to accident investigation and improvement of safety in the aviation industry.
- (q) develop and approve directives, orders, circulars, and other publications.
- (r) enter in arrangements with other organisations to facilitate the conduct of investigations.
- (s) provide relevant, timely and validated information to the families and the accident survivors regarding the progress of the investigation.
- (t) establish Safety data collection and processing systems, with protection measures to enable the sharing and exchange of information, as required under Annex 19.
- (u) coordinate and ensure the implementation of State Safety Programme (SSP) activities related to the Bureau.
- (v) if possible, the determination of the causes and/or contributory factor(s);
- (w) the compilation, completion and publication of the Final Report;
- (x) periodic review of global accidents, incidents, trends and advice.

3.4.8. Staffing Requirements

3.4.8.1 General

- 3.4.8.1.1 Staffing of the Bureau with a sufficient number of qualified and experienced investigators to accomplish all tasks/activities related to conduct of investigation of aircraft accidents and incidents. These tasks and activities include: making/amending Regulations, instructional duties, developing and amending manuals, conduct of investigation, management duties, research, safety studies, attending meetings, trainings, conferences, and workshops, etc.
- 3.4.8.1.2 The Manager of Investigation Division in coordination with Heads of Technical and Operations Units, should conduct calculation of investigation staffing level in all specialties or sections of the investigation to determine the number of additional investigators required to fulfil the objectives of the Bureau. The outcome of this calculation should indicate the number of additional investigators required to ensure the objectives of the Bureau is achieved. The number of additional investigators determined in the calculation process should form part of the Investigation Division inputs into the budget of the Bureau so that provision is made to ensure the anticipated salaries, allowances, equipment, training needs and other resources required to induct the future employees are taken into account.
- 3.4.8.1.3 Upon approval of the budget for the year, the Manager of Investigation Division in coordination with Heads of Technical and Operations Units should develop the Job Descriptions (JDs) for the additional investigators, indicating the job specification, qualifications and experience requirements.



3.4.8.1.4 The Manager of Investigation Division should forward the JDs to the Manager of Admin and Finance so that the recruitment process of additional investigators should commence in accordance with the Human Resource Manual of the Bureau.

3.4.8.1.5 The template for calculating staffing needs is in appendix S of this manual.

3.4.8.2 Methodology for Determining Investigation Staffing Needs

3.4.8.2.1 For the purpose of determining the number of qualified Investigators required within the Bureau, a calculation is made to assess the total regulatory commitment. This is based on the number of expected Investigation activities to be conducted over a particular reporting cycle, typically one (1) year.

3.4.8.2.2 The calculation of required staff shall be reviewed not less than three (3) years, however in case of need as a result of staff capacity building, acquired experience and the change of the level of activities, review can be done within three (3) years.

3.4.8.2.3 The output of the calculation is an overall approximation of the Investigation resource requirement. This is expressed as the total number of Investigators required to deliver the Investigation task. The Bureau will ensure, through recruitment, training, and investigation recommendations, that from the total available resource, individual functional areas are adequately resourced. This may involve the use of Investigators working in more than one functional area where their qualifications and training make it appropriate to do so.

3.4.8.2.4 The process below is used to calculate the total number of man-days required for Investigation Activities:

(The Total Investigator Annual time required divided by the Investigator Available Hours per year) Plus, ten percent (10%) of unpredicted task).

The output of this calculation is the anticipated investigation resource requirement for routine, steady Bureau Investigation activities. The process also captures those unpredicted tasks required to be undertaken by Bureau staff that support the routine Investigation program.

When the outcome of the staffing needs calculation is a whole number and half e.g., 1.5, the figure will be rounded up to the next whole number e.g., 2.0 which implies the need for two staff. Below a whole number and half e.g., 1.4 may not necessarily require two staff but someone can be contracted to perform some specific tasks.

Below is the staffing needs template:

Investigator tasks;

Tasks	Number of Days	Number of Task Per Year	Total Number of Hours per Day	Total Number of Hours



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GRAND TOTAL				
Unpredictive task is 10% of the above activities				
Total Investigator annual time required	Total number of hours for Investigation activities + total hours of Unpredictive task (in hours)			
Total Investigator annual time required	(763+76.3 = 839.3) hours			

Investigator Availability Hours;

1	Staff Working hours (08:30 – 16:30)	8hrs	
2	Break time (13:00 – 14:00)	1hr	
3	Number of days in a year	365 days	
4	National Holidays on Average per Year	12 days	
5	Weekend days	104 days	
6	Annual Leave	30 days	
7	Sick leave	10 days	
8	Training/Workshop/conferences	30 days	
9	No. of Working Days after items 4,5,6,7& 8 above	$3 - (4 + 5 + 6 + 7+8)$	
10	Productive Hours per Day	(1-2)	7hrs
11	Investigator Available Hours	9 x 10	1267hrs

$$\text{Number of Investigator required} = \frac{\text{Total Investigator annual time Required}}{\text{investigator Available Hours}}$$

$$\text{Number of Investigator required} = \frac{839.3}{1267} = 0.66$$



3.4.9 Job Description of Investigation Personnel

- 3.4.9.1 A job description (JD) is a document that describes the general tasks, or other related duties, and responsibilities of a position. It may specify the functionary to whom the position reports, specifications such as the qualifications or skills needed by the person in the job, information about the equipment, tools and work aids used, working conditions, physical demands, and a salary range. Job descriptions are usually used strategic human resource planning methodologies to develop a competency architecture for an Bureau, from which JDs are built as a shortlist of competencies.
- 3.4.9.2 Having up-to-date, accurate and professionally written job descriptions is critical to the Bureau's ability to attract qualified candidates, orient and train employees, establish job performance standards, develop compensation programs, conduct performance reviews, set goals and meet legal requirements.
- 3.4.9.3 Accordingly, a JD is usually developed by conducting a job analysis, which includes examining the tasks and sequences of tasks necessary to perform the job. The analysis considers the areas of knowledge, skills and abilities needed to perform the job. Job analysis generally involves the following steps:
- a) collecting and recording job information;
 - b) checking the job information for accuracy;
 - c) writing JDs based on the information;
 - d) using the information to determine what skills, abilities, and knowledge are required to perform the job;
 - e) updating the information from time to time.
- 3.4.9.4 Once the job analysis is complete, the JD including the job specification can be developed. A JD describes the activities to be performed and a job specification lists the knowledge, skills and abilities required to perform the job. A JD contains several sections including an identification section, a general summary, essential functions and duties, job specifications, and disclaimers and approvals.
- 3.4.9.5 JDs are then used to develop effective Human Resources planning, recruiting, and selection initiatives; to maintain clear continuity between compensation planning, training efforts, and performance management; and to identify job factors that may contribute to workplace safety and health and employee/labor relations.
- 3.4.9.6 A JD may include relationships with other people in the Bureau such as Supervisory level, managerial requirements, and relationships with other colleagues.
- 3.4.9.7 Each personnel are assigned customized JD indicating the person's job specification as a stand-alone document which is signed by the person. When the person changes job or additional tasks are assigned, the JD is revised.
- 3.4.9.8 A JD is often used by the Bureau in the recruitment process. it is not limited to explaining the current situation, or work that is currently expected; it also sets out goals for what might be achieved in the future, such as possible promotions routes and conditions.

Appendix II to the Staff Terms and Conditions of Service Manual contains the JDs of the Bureau's staff.



3.5 OFFICE FACILITIES AND EQUIPMENT

3.5.1 Office

3.5.1.1 The Bureau has its headquarter office in Freetown which consist of the offices of the Commissioner, Manager of Investigation, Manager of Admin and Finance, Investigators, Technical Officers and other support staff.

3.5.1.2 The Bureau has provided its personnel with office equipment means of communication and transportation in addition to other facilities, necessary to enable them to carry out their assigned duties. Example of the office equipment are; Laptop Computers, Internet, Hotline Telephone, Mobile Phone, Vehicle, Printer, Photocopier, scanner and so on.

3.5.2 Wreckage and Material Storage Facilities

At the moment the Bureau does not have an existing wreckage hangar/ storage facility. However, the Bureau has made arrangement (MoU) with the Freetown International Airport to make available a hanger/storage facility for the purpose of preserving evidences and maintaining custody of wreckage and if required, reconstruction of aircraft involved in accident for the investigation. In the absence of a hangar facility, the airport should provide a dedicated land/space for the erection of a temporary tent/structure for the storage and/or reconstruction of wreckage and preservation of evidences.

3.5.3 Facilities for Archiving and Storage of Investigation Files and Documents

3.5.3.1 Investigation Activities Room

3.5.3.1.1 The investigation room should have provision for Investigation Review Areas for conducting analysis of factual information, witness interview, drafting and technical review of reports; and the Archives section for storage of investigation files, material evidences and documents obtained in the course of conducting investigation.

3.5.3.1.2 The investigation review area should be equipped with the appropriate furniture, audio-visual gadgets, computer systems, scanners, photocopiers and internet services.

3.5.3.1.3 The Archives section should be equipped with waterproof containers, fireproof cabinets, lockable shelves, dedicated computer systems, hard drives and scanners for storage of investigation files, material evidences and documents obtained in the course of accident investigation.

3.5.3.2 Archiving, Security, Storage and Retrieval of Investigation Files and Documents

3.5.3.2.1 The Bureau has established an Electronic and Hard copies Aircraft Accident investigation Filing System in its office. The access should be restricted to investigators and any other duly authorized persons.

3.5.3.2.2 All accident and incident investigation materials (soft and hard copies), including the investigation files, folders, investigators' notes, copies of aircraft documents, operators documents and manuals, recordings of witness interviews, crew statement, copies of FDR downloads and analyses, CVR recordings and transcripts, ATC recordings, tower watch logs and transcripts, test and research reports, medical records and medical tests/autopsy reports shall be properly archived in a secure place.



3.5.3.2.3 Due to the sensitivity and confidentiality nature of the investigation materials, it is imperative that these materials are retrieved from the Investigators-in-charge (IICs) for proper archiving as soon as the investigation is completed and the related Final Reports issued to the public.

3.5.3.2.4 Each investigation file should contain the following:

- a) The Completed notification Form
- b) Completed Forms and Checklists
- c) Copies of relevant aircraft documents
- d) Copies of crew licenses and other documents
- e) Crew medical information
- f) Statements taken from witnesses
- g) Record of interviews
- h) All correspondences, transmittal letters
- i) ATC transcript and CVR transcript
- j) FDR/CVR raw data/readouts/plots
- k) CVR/ATC recordings
- l) Onboard image recordings
- m) Report from laboratory test of components
- n) Autopsy/Medical report
- o) Details of the participants in the investigation including their credentials
- p) Photos and videos of evidences
- q) Analysis of and opinion about information made by investigators and participants
- r) Investigators Notes
- s) Weather report
- t) ARFFS report
- u) SAR report
- v) Comments received
- w) Preliminary report
- x) Draft final report
- y) final report

3.5.3.2.5 Technical Officer shall properly tag and classify as confidential all investigation materials including files.

3.5.3.2.6 The Investigator-in-charge of an investigation shall:

- a) upon completion of an investigation and release of the Final Report, the IIC should ensure that the hard copies of the investigation materials are scanned, where possible, properly arranged and tagged; and
- b) hand over all the materials connected to the investigation (electronic, paper and others) to the Technical Officer for Archiving.

3.5.3.2.7 The Technical Officer shall:

- a) receive the materials and make entry of the details of the materials in the dedicated paper and computer registers;



- b) save the electronic copies of the materials in a dedicated computer and the duplicate is to be uploaded to share point (or server);
- c) create directory with passwords and only authorized persons are given log in details in order to control access to the materials;
- d) save the electronic copies on a dedicated External Hard Drive. The External Hard Drive should be tagged and kept in a secure save; and
- e) package the paper/hard copies in a suitable container (waterproof), Label the containers and place them in lockable cabinet.

3.5.3.2.8 Each accident investigation documents, including investigation files, associated material evidences and documents obtained in the course of accident investigation shall be kept protected in the Archives for a minimum period of twenty years following the release of related Final Reports. Thereafter, The Commissioner may wish to discard them in a manner to avoid inappropriate disclosure to the public.

3.6 FUNDING OF INVESTIGATIONS

3.6.1 General

According to Section 75(1) of the Civil Aviation Act of Sierra Leone, the funds of the Bureau shall be financed with sufficient and supplementary funds consisting of:

- a) subventions through the budgetary allocations from the Government;
- b) 10% of Civil Aviation charges due to the Bureau from the Bank of Sierra Leone
- c) supplementary funds set aside by the Government to be disbursed to the Bureau in the case of a major accident or justified need to enable the fulfilment of the obligations of the Bureau.

3.6.2 Accessing of supplementary funds

3.6.2.1 Section 75(2) of the Civil Aviation Act states that the Government shall ensure supplementary funds are readily available in the case of a major accident or justified need to enable the fulfilment of the obligations of the Bureau.

3.6.2.2 In the event of a major accident occurring in which the Bureau is required to conduct investigation, the commissioner will immediately upon receipt of a notification of an accident, shall write to the Minister of Transport and Aviation requesting the release of the supplementary fund to the Bureau. The Minister should expedite the process of the release of the supplementary funds to enable the Bureau access the funds as soon as practicable.

3.6.2.3 The supplementary fund will be used to facilitate the conduct of investigation into Major accident.

3.7 ETHICS AND CODE OF CONDUCT FOR INVESTIGATORS

In order to achieve the Bureau's mandate of conducting independent, thorough and impartial investigation of accidents and incidents, it is imperative that all employees of the Bureau, and in particular, Personnel who perform Investigation duties must conduct themselves in-line with this ethics and code of conduct during an accident or incident investigation. The Bureau has adopted International Society of Investigators (ISASI) code of conduct designed to provide guidance to employees on the principles of behavior at work. Personnel assigned to investigation duties are expected to adhere this ethics and Code of conduct insofar as it does not conflict with the codes of public service.



3.7.1 Integrity

3.7.1.1 Each employee should at all times conduct his activities in accordance with the high standards of integrity required of his profession.

3.7.1.2 Therefore, each employee shall:

- a) Not attempt, or assist others to attempt, to falsify, conceal or destroy any facts or evidence which may relate to an accident.
- b) Not make any misrepresentations of fact to obtain information that would otherwise be denied to him.
- c) Be responsive to the feelings, sensibilities and emotions of involved persons, and shall avoid actions which might aggravate what may already be a delicate situation.
- d) Not divulge fragmentary or unsupported information concerning the accident to parties external to the investigation no matter how publicly important such parties may appear to be.
- e) Avoid actions or comments which might be reasonably perceived during the fact-finding phase of the investigation as favoring one party or another.
- f) Establish and adhere to the chain of authority with attendant responsibilities throughout the course of the investigation.
- g) Not attempt to profit, nor accept profit, other than by normal processes of remuneration for professional services.
- h) Remain open-minded to the introduction of new evidence or opinions as to interpretation of facts as determined through analysis, and be willing to revise one's own findings accordingly.
- i) Avoid any implication of professional impropriety by continuously applying the foregoing principles to one's own endeavors, and encouraging the application of these same principles to others associated with Investigation.

3.7.2 Objectivity

3.7.2.1 Each employee should lend emphasis to objective determination of facts during investigations.

3.7.2.2 Therefore, each employee shall:

- a) Ensure that all items presented as facts reflect honest perceptions or physical evidence that have been checked insofar as practicable for accuracy.
- b) Ensure that each item of information leading to fact determination be documented or otherwise identified for a reasonable time for possible follow-up by others.
- c) Use the best available expertise and equipment in determining the validity of information. Pursue fact determination expeditiously.



- d) Following all avenues of fact determination which appear to have practical value towards achieving accident prevention action.
- e) Avoid speculation except in the sense of presenting a hypothesis for testing during the fact-finding and analysis process.
- f) Refrain from release of factual information publicly except to authorized persons, by authorized methods and then only when it does not jeopardize the overall investigation.
- g) Handle with discretion any information reflecting adversely on persons or organizations and, when the information is reasonably established, notify such persons or organizations of potential criticism before it becomes a matter of public record.

3.7.3 Logic

Each employee should develop all accident cause-effect relationships meaningful to air safety based on logical application of facts. Therefore, each employee shall:

- a) Begin sufficiently upstream in each sequence of events so as to ascertain practicable accident prevention information.
- b) Continue downstream in a sequence of events sufficiently to include not only accident prevention information but also crash injury prevention, search and survival information.
- c) Ensure that all safety-meaningful facts, however small are related, to all sequences of events.
- d) Delineate those major facts deemed not to be safety-related, explaining why they should not be considered as critical in the sequences of events.
- e) Be particularly alert to value judgments based upon personal experiences which may influence the analysis; and where suspect, turn to colleagues for independent assessment of the facts.
- f) Express the sequences in simple, clear terms which may be understood by persons not specializing in a particular discipline.
- g) Include specialist material supporting the analysis either in an appendix or as references clearly identified as to source and availability.
- h) Prepare illustrative material and select photographs so as not to present misleading significance of the data or facts thus portrayed.
- i) List all documents examined or otherwise associated with the analysis and include an index thereof.

3.7.4 Principles

Each employee should respect and adhere to the principles on which the Bureau was founded and developed, as illustrated by the Bureau's establishing Act and the regulations. Each employee shall:

- a) Promote accident investigation as a fundamental element in accident prevention



- b) Assist other employees to carry out their accident investigation tasks.
- c) Not use status to effect personal gain or favor.
- d) Not represent the Bureau or imply a position of the Bureau in public utterances on any issue unless prior written authority has been received from the Commissioner or any officer assigned by him.
- e) Encourage uninhibited, informal interchange of views among employees; however, any sensitive information thus gained shall not be made public or transmitted to others without clear approval of the person from whom the information was gained.
- f) Have an obligation to improve the professional image of the Bureau, however, employees shall:
 - i. Refrain from unfounded criticism of officers of the Bureau either publicly or privately unless the matter is investigated thoroughly and brought to the attention of the management with reasonable time being allocated to review the situation and act accordingly.
 - ii. Refrain from public criticism of any fellow employee unless that individual has first been apprised of the alleged basis for that criticism and given an opportunity for rebuttal.
- g) Encourage and participate in the education, training and indoctrination of personnel likely to become involved actively in accident investigation.
- h) Develop and implement a personal program for a continually improving level of professional knowledge applicable to accident investigation.

3.7.5 Accident Prevention

Each employee should apply facts and analyses to develop findings and recommendations that will improve aviation safety. Each employee should:

- a) Identify from the investigation those cause-effect relationships about which something can be done reasonably to prevent similar accidents.
- b) Document those aviation system shortcomings learned during an investigation which, while not causative in the accident in question, are hazards that may require further study and/or remedial action.
- c) Communicate facts, analyses and findings to those people or organizations which may use such information effectively; such communication to be constrained only by investigation policies and procedures of the Bureau.
- d) Provide specific, practical recommendations for remedial action when supported by the findings of the accident having been investigated singly or as supported by other cases.
- e) Communicate the above noted information in writing, properly identified as a matter of record.



- f) Encourage retention of relevant investigation evidence within the aviation system in such a manner as to form an effective baseline for further investigation of the given accident and/or facilitate analysis in connection with future accidents.
- g) Demonstrate a respect for interpretation of facts by others when developing conclusions regarding a given accident and provide reasonable opportunity for such views to be made known during the course of the investigation.

3.8 SUMMARY

It is the policy of the Bureau to meet the requirements specific to this chapter is to ensure that the sole purpose of investigations is to prevent future accidents. Any judicial or administrative proceedings to apportion blame or liability shall be separate from the Bureau's investigations. The Bureau shall have functional independence in the conduct of an investigation and unrestricted authority over its conduct, with the intent that any appointed investigation team can withstand interference or pressure from any source while guided by the ethics and code of conduct for investigation.



PLANNING



CHAPTER 4 - PLANNING AND PREPARATION FOR INVESTIGATION

4.1 GENERAL

- 4.1.1 In order to conduct proper investigations, investigators of the Bureau must be fully prepared and must have a plan of action before an accident or incident occurs. Pre-investigation planning and preparedness involves several elements, including establishing the legislative framework and guidance materials, functional organizational structures, access to sufficient funding, documented policies, procedures and checklists required for investigation, a plan for sufficient and experienced staffing of key positions on an investigation team, investigation field kits and personal protective equipment, and determining internal competencies and plan to acquire additional resources to fill any identified gaps.
- 4.1.2 Other considerations include Memoranda of Understanding (MoU) with other Sierra Leone government agencies and aviation industry organizations, as well as aircraft accident investigation authorities in other States, as a means to obtain assistance in the form of qualified Investigators, specialists and facilities when required. It is important to have temporary arrangements in place for the secondment of additional staff from other Sierra Leone government and industry organizations under some circumstances. Such external experts should be relieved of their regular duties for the duration of the investigation or as applicable, so as to avoid possible or potential conflict of interests.
- 4.1.3 The seconded specialist- investigators should be provided adequate training with the necessary tools, investigation equipment and personal protective equipment to ensure their safety at the accident site.
- 4.1.4 Proper planning and preparedness are essential in facilitating the prompt arrival of Investigators at an accident site and have considerable bearing on the efficiency of the investigation.

4.2 THE SELECTION AND APPOINTMENT OF INVESTIGATORS

- 4.2.1 It is the policy of the Bureau to follow the guidance contained in ICAO Circular 298 regarding selection, appointment and training of Technical Officers and Investigators.
- 4.2.2 Investigators of the Bureau are issued government credentials, which specify the legislative and regulatory basis for their authorities and responsibilities. For further details refer to section 4.4.6 of this manual.
- 4.2.3 The Bureau may sign agreements with states accidents investigation authorities and/or civil aviation authorities for secondment of qualified personnel on a very short notice and without having to establish formal agreements and arrangements when the need arises. Appendix C contains copies of current MoUs.
- 4.2.4 The Bureau has made suitable arrangements on short notice to enlist the necessary support staff from other organizations within the country. The use of outside expertise is accomplished by written contract and/or Memorandum of Understanding (MoU) which include provisions to ensure that the seconded individuals are relieved of their regular duties during the course of the investigation. Their independence and objectivity in the investigation work is essential, and it is important to ensure there are no real or perceived conflicts of interest on the parts of seconded individuals. The seconded individuals should be given proper credentials and should sign written agreements (see appendix E4) to comply with the current Civil Aviation Act, regulations, policies and procedures, and to demonstrate their independence and objectivity, and that there are no conflicts of interest during the period of the secondment.



4.2.5 The Bureau should maintain a list of qualified Investigators who are appointed to key positions to form Go Team.

4.3 BACKGROUND EXPERIENCE FOR INVESTIGATORS

4.3.1 In accordance with guidelines provided by ICAO Circular 298, aircraft accident investigation is a specialised task which should only be undertaken by qualified investigators. 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.

4.3.2 Potential accident investigators must have considerable practical experience in aviation as a foundation on which to build their investigation skills. This experience can be acquired 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 accident investigator training. Since accident investigations will often involve specialised 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.

4.3.3 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 a Technical 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.

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

- 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 analyse 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.

4.3.5 In addition to technical skills and experience, an accident investigator requires certain personal attributes. These attributes include integrity and impartiality in the recording of facts; ability to analyse 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.

- 4.3.6 An accident investigator is desirous to have investigation management qualification and skills in team leadership, relations with numerous State authorities and private organizations, international relations, communication and report writing.

4.4 INVESTIGATOR QUALIFICATION REQUIREMENTS

4.4.1 Investigator Qualifications

4.4.1.1 Investigators conduct highly technical work and occupy sensitive and authoritative positions as representatives of the Bureau and the Government of Sierra Leone. It is essential that new investigator candidates meet the highest standards of competence and integrity.

4.4.1.2 The minimum requirements for the selection of Investigators are provided below, while not absolute, these qualifications and experience requirements provide important guidelines for initial employment of investigators.

4.4.1.3 Policy, Planning and implementation of recruitment exercises, deployment and retention of employees is the primary responsibility of the Admin and Finance Division while the Investigation Division provides technical advice in this regard. Details are in the SL-AAIIB’s HR Manual and Staff Conditions of Service.

4.4.2 Minimum Entry Requirements

Personnel recruited and deployed to the Investigation Division shall possess minimum entry qualifications and experience as applicable to the position assigned. The minimum academic and experience requirements for new-hire are provided below:

S/N	Employee Category	Minimum Entry Requirement
A	Intermediate/Assistant Officer/Officer/	HND/OND or equivalent professional qualification from a recognized institution and work experience may be an added advantage.
B	Senior Officer/Technical Officer	A Bachelor’s Degree or equivalent professional qualification from a recognized institution in relevant discipline with work experience.
C	Investigator/Manager	Bachelor’s Degree or equivalent professional qualification from a recognized institution with relevant discipline or appropriate experience to the operations of the Bureau. A Master’s degree may be an added advantage.



For specific qualification and experience requirement for positions in Investigation Division, refer to the Job Descriptions as set in the Bureau's Staff Terms and Conditions of Service.

4.4.2.1 Minimum Qualification for Trainee-Investigator

- (a) Possess Degree in Mechanical Engineering or Electrical/Electronic Engineering or possess qualifications in Aeronautical Licenses or Academic Degrees in Aeronautical/Aerospace Engineering or related Engineering discipline; or a holder of any professional licenses in the field of aviation; and or having the relevant professional knowledge, background, and appropriate experience related to Civil Aviation, Air Transport, Military Operations, etc.
- (b) A minimum of three (3) years' experience in Aviation related industry.

4.4.2.2 Minimum Qualification for Investigator

- (a) Shall be a trained and qualified investigator.
- (b) Possess Degree in Mechanical Engineering or Electrical/Electronic Engineering or possess qualifications in Aeronautical Licenses or Academic Degrees in Aeronautical/Aerospace Engineering.
- (c) A minimum of five (5) years' experience in Aviation related industry.

4.4.2.3 Minimum Qualification for Senior Investigator

- (a) Shall be a trained and qualified investigator.
- (b) Possess Degree in Mechanical Engineering or Electrical/Electronic Engineering or possess qualifications in Aeronautical Licenses or Academic Degrees in Aeronautical/Aerospace Engineering.
- (c) A minimum of ten (10) years' experience in Aviation related industry.

4.4.3 Secondment of Experts to Investigation

4.4.3.1 Introduction

- 4.4.3.1.1 The use of outside expertise to augment the technical staffing of the Bureau during major accidents or when certain expertise is desired for an investigation necessitates the Bureau to source for such experts from organizations within and outside Sierra Leone.
- 4.4.3.1.2 The secondment of such experts to investigation conducted by the Bureau is accomplished by written contract and/or Memorandum of Understanding (MoU) with relevant donor organizations. The contracts or MoUs governing secondment of the experts should include provisions to ensure that the seconded individuals are relieved of their regular duties during the course of the investigation. Their independence and objectivity in the investigation work is essential, and it is important to ensure there are no real or perceived conflicts of interest on the parts of seconded individuals or their organizations.
- 4.4.3.1.3 The seconded individuals should be given proper credentials and should sign written agreements (see appendix E4) to comply with the laws, regulations, policies and procedures, and to demonstrate their independence and objectivity, and that there are no conflicts of interest during the period of the secondment.



- 4.4.3.1.4 A conflict of interest is a situation in which a person or entity has two or more competing interests or responsibilities. A conflict of interest can also be defined as a set of conditions in which professional judgement concerning a primary interest tends to be unduly influenced by a secondary interest.
- 4.4.3.1.5 In others words, a conflict of interest is a clash between the personal interests and the official responsibilities of a person in a position of trust and credibility. It can appear in a different form and involve both personal and professional interests. When a conflict of interest occurs, the individual or a group of persons involved find it difficult to maintain objectivity and eliminating bias in judgement while performing their investigation duties.
- 4.4.3.1.6 A real conflict of interest arises when a vested interest has the potential to unduly influence personnel or organizational judgement/action through the monetary or material benefits it confers on the personnel or organization.
- 4.4.3.1.7 The following are some of the examples of a real conflict of interest; the expert is confronted with a dilemma. He is in conflict between two social values – professional duty to be objective and duty to family:
- a) An SLCAA expert seconded to investigation of an accident involving the aircraft which his relative or his close colleague certified to be airworthy prior to the accident; or
 - b) A situation where an expert seconded to an accident investigation suddenly discovered that his relative was a victim of the accident.
- 4.4.3.1.8 A potential conflict of interest is one that is not actual and does not seem to show immediately but, in time, could become apparent. One example is for instance an employee of the Air Navigation Services Provider (ANSP) is seconded to an investigation in which the ANSP's equipment or personnel interacted with the aircraft prior to the accident, as it is not apparent at the initial point of the investigation, if the ANSP personnel or equipment could have contributed to the accident.
- 4.4.3.1.9 A perceived conflict of interest arises when a vested interest has the potential to unduly influence official or agency judgement/action through the non-monetary or non-material influences it exerts on the official or agency. In these situations, there may be real or potential conflict and this can have its own ramifications.

4.4.3.2 Criteria for Selection of Seconded Specialists

- 4.4.3.2.1 The candidate for secondment as an investigator to the Bureau from the SLCAA or any aviation service provider within the country must meet the following qualification and experience requirement prior to being seconded to the Bureau as an investigator:
- a) Qualified Aviation Safety Inspector (Operations, Airworthiness, engineering, Air Traffic Control, etc.), preferably with aircraft or relevant type ratings and/or instructor ratings and level of experience equivalent to the requirements for employment as an investigator;
 - b) Attended aircraft accident investigation training at a recognized institution or organization; and
 - c) May have participated in an aircraft accident investigation.



4.4.3.3 Management of Conflict of Interest of Seconded Expert.

4.4.3.3.1 As has been stated above, a conflict-of-interest situation has the potential to cause an investigator, especially experts seconded from outside the Bureau to compromise or have bias professional judgement and objectivity when their individual or their organizational reputation or interests are at stake. When an employee of an organization within or outside Sierra Leone is being considered for secondment to participate in the investigation conducted by the Bureau, there should be provisions to ensure conduct of assessment to identify real, potential or perceived conflicts of interest that could arise.

4.4.3.3.2 The objective of the assessment is to proffer measures to avoid or manage the situation of the real, perceived or potential conflicts of interest of the experts from other organizations seconded to participate in the investigation.

4.4.3.3.3 The need to put the emphasis on prevention of conflicts of interest, rather than management. It is important to identify conflicts of interest at the outset and then to take steps to avoid them. This should always be the preferred option. Vigilance against conflicts of interest that lead to loss of objectivity and bias during conduct of investigation is highly desired.

4.4.3.3.4 Measures or approaches for identifying and preventing conflicts of interest are:

- a) Disclosure and transparency - an expert seconded to the investigation or his organization should disclose his connections and loyalties to all internal and external parties to the Investigator-in-charge if an actual or potential conflict of interest exists at the onset of, or at any point during an investigation. The expert is encouraged to decline the offer of secondment or voluntarily remove themselves from the investigation if they find themselves in a situation of competing loyalties.
- b) Screening – The Manager of Investigation Division in conjunction with the investigator-in-charge should screen the proposed experts with conflicting interests to prevent them from being involved in the investigating areas relevant to their primary responsibilities or areas of work while on secondment to an investigation.
- c) All experts seconded to an investigation from external organizations should be removed from their primary duties until the end of the investigation.
- d) All experts seconded to the investigation must sign the letters of agreement and abide by the conditions of their participation therein, including reduced interaction with their offices of primary duties.
- e) At any point during the investigation, when it becomes apparent that an expert is found to violate the conditions of his participation in the investigation, the investigator-in-charge should recuse such expert from further participation.

4.4.3.3.5 The Manager of Investigation Division in conjunction with the investigator-in-charge responsible to assess whether there is a conflict of interest prior to engaging any expert seconded to the investigation using checklist SL-AAIB.01.88.

4.4.4 Composition and Roster of the Go Team

4.4.4.1 Composition of the Go Team

4.4.4.1.1 A Go Team is a group of Investigators, consisting of all required specialists who are on-call for immediate assignment to conduct accident or incident investigations. The Go Team comprises of an IIC and a number of specialists depending on the magnitude of the occurrence. For accident involving a light aircraft or



serious incident without serious injuries, the Go Team may comprise of just an IIC and one other Investigator. However, for investigation of a major accident involving large transport aircraft, a full Go Team is required. This will be based on the probable scope of the investigation and the magnitude of the tasks, but will also include the following factors:

- a) The number of injuries/fatalities;
- b) Type of aircraft;
- c) Previous accidents of this type;
- d) Location of the accident;
- e) Extent of aircraft or ground damage;
- f) Weather;
- g) Public interest; and
- h) Specialist workloads.

4.4.4.1.2 The Commissioner or any officer assigned by the Commissioner is responsible for appointing IIC for each investigation.

4.4.4.1.3 A full Go Team may consist of the following groups of specialists:

- a) Air Traffic Control;
- b) Operations;
- c) Meteorology;
- d) Human performance and limitations (human factors);
- e) Structures;
- f) Systems;
- g) Powerplants;
- h) Maintenance records;
- i) Survival factors;
- j) Aircraft performance;
- k) Cockpit voice recorder;
- l) Flight data recorder and
- m) Metallurgy.



Note 1— Additional groups may be formed to interview witnesses, examine the response of aircraft rescue and firefighting (ARFF) personnel, or other duties, as required to support the investigation.

4.4.4.1.4 Investigator-in-charge (IIC) will be the overall chairman of the Go Team. The Bureau specialists should be the head in each of the groups. The Bureau's Technical officers/ Trainee-Investigators who are on training will be assigned as members of investigative groups under the supervision of another experienced Investigator, usually a group chairman or IIC.

4.4.4.2 The Go Team Roster

4.4.4.2.1 The Go Team roster is a spreadsheet of names and telephone numbers of all Bureau's Investigator(s) in the custody of the Manager of Investigation Division.

4.4.4.2.2 The Go Team members must prepare for immediate departure to the accident site. All Investigators are 24-hour on call duty. All personnel on call should arrange their affairs such that they are able to depart for the site of an accident with a minimum delay not later than 2 hours. Investigators should always ensure that they can be reached when needed.

Note - The Commissioner is responsible for determining if an investigation will be lunched for incidents while taking into consideration of the possible safety lessons to be learnt and availability of resources to conduct the investigation.

4.4.5 Investigators Training

The Training Policy of the Bureau and the Training Programme for investigators are in the Bureau's Training Procedure Manual.

4.4.6 Issuance of Investigator Credentials

4.4.6.1 When a new candidate is selected from the aviation industry or equivalent industry, he/she is issued a position of either Technical Officer (TO) or Trainee/Developmental Investigator. He/she must then complete the training requirements specified in the Bureau's Training Procedure Manual before being given authority to accomplish any investigator job task without direct supervision.

4.4.6.1.1 A Technical Officer is a person who has been hired as a Technical Officer by the Bureau who met the minimum recruitment standards specified in the Terms and Conditions of Service Manual of the Bureau but does not have aviation related experience. The individual in this category will continue to develop their knowledge, competence and skills through classroom training and on-the-job-training and experience under the guidance of the Bureau until meeting the minimum qualification requirements for investigator. A Technical Officer is issued a Trainee-Investigator Credential.

4.4.6.1.2 A Trainee/Developmental Investigator is a person who meets all the minimum qualification recruitment standards specified in the Terms and Conditions of Service Manual of the Bureau but has not yet completed the core training requirements for an Investigator. A Developmental Investigator is issued Trainee-Investigator Credential.

Note - The core training requirements to be qualified for issuance of investigator credential comprise of Indoctrination, Initial and Basic Aircraft Accident Investigation trainings.



- 4.4.6.2 All new hire employees normally begin formal classroom training with Indoctrination training followed by investigation initial training and then undergoes an On-the-job-training (OJT) on the investigator initial training. After successfully completing these training requirements a new investigator is then issued Bureau's Investigator Credential, but at this point any job task accomplished must still be under the direct supervision of another qualified investigator or OJT Instructor. All new-hire Investigators must complete both the formal training course and On-the-Job training on the associated Job Tasks before being given authority to accomplish a job task by himself/herself.
- 4.4.6.3 After receiving an Investigator Credential, the new investigator or Technical Officer normally continues training until he/she has completed training in all the subject areas that comprise the core investigator training requirements.
- 4.4.6.4 The Bureau's Investigator Credential (refer to Appendix I1) must make reference to the appropriate section of the Civil Aviation Act and/or the Regulations that empower the Bureau and its employees to conduct aircraft accident and incident investigations. The Investigator Credentials must be signed by the Commissioner and must contain a photo and signature of the holder. It must have a validity of three (3) years.
- 4.4.6.5 The Bureau also issues Credentials (refer to Appendix I2 – I6) to other participants of its investigation such as accredited representatives, advisers, experts, specialists/Participants, observers, etc. such Credentials are normally accompanied with their Letters of Acceptance or Appointment. The Credentials should be returned to the Investigator-in-charge upon completion of the investigation or when the participation of such holder of the credential in the investigation ends, or no longer required/suspended or terminated.
- 4.4.6.6 When an Investigator Credential is lost or misplaced, the holder should submit a written report to the Manager of investigation division or any personnel so designated by the Commissioner, explaining the circumstance under which the credential was lost in addition to any administrative requirements to be determined by the Manager of investigation division. Upon completion of investigation into the circumstance surrounding the loss of the credential, the Manager of investigation or personnel so designated may recommend re-issue of the credential to the investigator concerned.
- 4.4.6.7 Full-time or Part-time investigators should return their Investigators Credentials to the Manager of investigation upon leaving the employment of the Bureau. The Investigators who are no longer qualified to conduct accident investigation should also return their credentials to the above officers of the Bureau as soon as possible.
- 4.4.6.8 The Manager of investigation division should keep records of all the issued/re-issued Investigator Credentials, including credentials and letters issued to accredited representatives, advisers, experts, observers, participants and seconded investigators.
- 4.4.6.9 Refer to Chapter 4 of the Human Resource Manual of the Bureau for detailed procedure on investigators credential.



4.5 SAFETY INVESTIGATOR EQUIPMENT

4.5.1 General

It is the policy of the Bureau to properly equip its Investigation Division with investigation and protective equipment against biological, environmental and natural hazards that may be encountered at accident sites.

4.5.2 The Admin Officer of the Bureau should ensure that investigation equipment to be used by Personnel are properly stored, reviewed and maintained periodically. The equipment could include cameras, notebook computers, mobile telephones, tools, etc. Specialized equipment may need to be stored at the office/store. List of equipment can be found in Appendix G of this manual.

4.5.3 Admin Officer should ensure that investigation field kits and essential items are packed and ready so that the Investigators can proceed without delay to the accident site.

4.5.4 The Admin Officer should ensure that comfortable and protective clothing against the conditions on site or elements that may be encountered are made available to personnel and spare clothing may also be required. The most essential items of personal clothing are; good footwear, windproof suit, waterproof suit, and appropriate headgear. Personnel should wear suitable boots which provide protection against the hazards at the accident site. Specifically, the boots should provide protection against crushing and piercing injuries and should be waterproof and oil and acid resistant. Protective items, such as sun block, anti-glare spectacles and insect repellent, should also be available.

4.5.5 The Admin Officer before proceeding to the accident site, Investigators and other relevant Personnel should have adequate supplies and equipment most appropriate to the territory to be covered (food, water, first-aid kit, camping gear, communication equipment, etc.) and should have a competent guide if it is necessary to enter wild or rugged terrain. They should anticipate the need for special equipment and have ready access to this type of equipment so that there is no delay in procuring it. They should also be familiar with the use of such equipment.

4.6.6 The investigation field kit should contain sufficient equipment to enable examination of the wreckage, the plotting of impact points and wreckage patterns, parts identification and the recording of observations. Refer to appendix G for the comprehensive list of Investigators' equipment, including the Go-Kit, collective tools and Biohazard protective kits and appendix H for the guidance on how to use the personal protective equipment (PPE) against biological hazards at accident sites.

4.5.7 Admin Officer is also responsible for ensuring adequate quantity of the kits, tools and personal protective equipment (PPE) are packed in suitable containers for ease of carriage to the accident site without causing delay in case of an accident. The Admin Officer should keep up-to-date the list of available investigators' kits, tools and personal protective equipment. The location of the kits, tools and the PPE should be made known to all Investigators anytime.

4.6 HEALTH AND SAFETY AT AN ACCIDENT SITE

4.6.1 Aircraft wreckage sites may expose Investigators and other Personnel to certain risks including biological hazards (blood borne pathogens), airborne hazards (vapors, smoke, dust from burnt composite materials, etc.), physical hazards (adverse terrain, sharp or heavy objects, unstable wreckage, etc.), dangerous goods (pressurized equipment, radio-active, flammable or toxic materials, etc.), adverse weather conditions, etc.



- 4.6.2 The IIC in conjunction with the Admin Officer should assume the duties of ensuring proper site safety and security to:
- a) be aware of the potential hazards at an accident site and what precautions to take through risk assessment checklist AIB.01.06.
 - b) be responsible for accident site safety and security matters and overseeing the personal protective equipment and its use.
 - c) ensure compliance with the provisions of this manual and other ICAO guidance material regarding the health and safety of investigators during the course of investigations.
- 4.6.3 Upon arrival at the site, the Bureau's investigator-in-charge (IIC) and Admin Officer should liaise or coordinate with the local firefight commander or police officer in charge (or first responders) to determine hazards at the site and safety resources available. The investigator-in-charge (IIC) should brief the investigation team on all known and potential hazards and should establish appropriate safety practices. An environmental risk assessment can be conducted while en-route and a more detailed assessment accomplished following the initial visit to the accident site. (See Appendix I for Accident Site Hazard Identification and Risk Assessment Checklist AIB.01.06). The IIC and Admin Officer will then develop countermeasures to identified risks and ensure that the appropriate countermeasures are applied at the accident site. All team members should be advised to be on the alert for any undeclared hazardous material and, if such material is found, should immediately notify the IIC so that appropriate measures can be taken.
- 4.6.4 During the IIC's opening statement, the IIC should state that the Bureau will neither assume responsibility for any personal injuries incurred during the course of an investigation by representatives of organizations participating in the investigation as a party or by authorized observer, nor will the Bureau provide PPE to party participants.
- 4.6.5 The assigned IIC will be responsible for conducting daily safety briefings with all individuals working at the accident site. The IIC shall monitor to ensure all personnel working at accident site display good conduct, judgment, use appropriate PPE as well as exercise caution.
- 4.6.6 The support of ARFF and dangerous goods specialists should be enlisted, as necessary, to evaluate known and/or potential hazards, and to brief the investigation team, as appropriate.
- 4.6.7 The site of aircraft accident may contain blood borne pathogens. Blood borne pathogens are viruses, bacteria, and parasites that are present in the blood, tissue, or other body fluids of infected persons. They include, but are not limited to, Hepatitis B and C virus (HBV) and the Human Immunodeficiency Virus (HIV), which causes AIDS disease. Some of these viruses do not die upon contact with oxygen or when the fluids dry out. Studies, in fact, show that certain climatic conditions may prolong the infectiousness of HIV. Those who work in or around the wreckage must use extreme caution to minimize direct contact with blood borne viruses. At a minimum, heavy leather gloves over non-permeable rubber gloves should be used and, in some case, will be required when touching the wreckage. Under certain conditions, such as within the wreckage where investigators may come into contact with blood or human remains. Full face masks, protective goggles, and disposable overalls and booties shall be worn.
- 4.6.8 All Investigators and other Personnel who work around/among wreckage or travelling to an area with certain known public health risks or suspected diseases are to be given a valid anti-tetanus serum inoculation and hepatitis immunization, as well as necessary personal protective equipment against biological hazards, such as blood-borne pathogens.



- 4.6.9 The Admin Officer should keep records of the immunizations for each Investigator and other Personnel. The records are kept in a safe and secured cabinet. The Admin Officer should review the records on an annual basis to identify recurring immunizations.
- 4.6.10 It is the policy of the Bureau to provide all Investigators and other Personnel with initial and recurrent training on biological hazard protective equipment and procedures (refer to Appendix H for the guidelines on PPE against Biohazards).
- 4.6.11 Manager of the Investigation Division is responsible for ensuring that the training is provided through the annual training plan.
- 4.6.12 Manager of the Investigation Division should keep records of such training for each Investigator and other Personnel.

4.7 COMMUNICATION EQUIPMENT

Modern communications equipment and infrastructure to enable effective coordination during investigations are made available. The Investigation Division is equipped with the under listed means of communication:

- a) Mobile phone; +232-76-738632
- b) Email; info@sl-aiib.com
- c) Website; www.sl-aiib.com

4.8 TRANSPORTATION AND TRAVEL ARRANGEMENT

- 4.8.1 The Admin Officer is responsible to facilitate sufficient support for much of the initial coordination effort necessary in terms of travel and hotel arrangement to launch the Go team. Whenever possible, the entire Go Team will travel together to the accident site. Adequate and appropriate operational transportation are provided for this purpose where accident can be accessed faster. The means of transportation is kept in order and duty drivers are always prepared and ready for deployment at the shortest notice.
- 4.8.2 Provisions can be made for quickest means of transportation of the team to the accident site. The Admin Officer should make arrangements for the team to stay in the same hotel as well as the arrangement for local transportation logistics from the hotel to the accident site for the entire duration of their stay.



INVESTIGATION



CHAPTER 5 - INITIAL NOTIFICATION AND RESPONSE

5.1 GENERAL

This chapter contains policies and procedures pertaining to:

- a) reporting requirements;
- b) initial notification and reporting of aircraft accidents and incidents to civil aircraft that occur in Sierra Leone;
- c) responses to initial notifications from other States regarding accidents and incidents that occur outside the country but involving interests of Sierra Leone; and
- d) delegation of a whole or a part of the investigation.

Note. — It is the policy of Sierra Leone and the Bureau to comply with the provisions of ICAO Annex 13, Chapter 4 Notification, regarding accidents and incidents occurring in Sierra Leone. Therefore, not all of the details contained in ICAO Annex 13, Chapter 4, are repeated herein.

5.2 REPORTING REQUIREMENTS

- 5.2.1 Early notification is essential to initiate and organize the investigation. Initial information concerning the facts and circumstances of the occurrence will often be incomplete and erroneous. For this reason, early factual information transmitted for alerting purpose must be handled with considerable discretion. Parties notified are to be cautioned about the preliminary nature of the data.
- 5.2.2 The Bureau's reporting checklist AIB.01.02 (refer to appendix J-2) is an extracted from ICAO Annex 13, Attachment B. It specifies the various reporting requirements for different types of accidents and serious incidents. It is the responsibility of the Bureau on behalf of Sierra Leone to comply with the notification and reporting requirements of ICAO Annex 13 (Chapters 4, 6 and 7). All notifications and reports will be forwarded in English language.
- 5.2.3 A link www.icao.int/safety/AIA/pages on the Bureau's website home page www.sl-aiib.com directs to the ICAO public FSIX website, which contains the updated addresses of aircraft accident investigation authorities of other States. The list of addresses of aircraft accident investigation authorities can also be found in the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part I Organization and Planning, however, the addresses in this manual might not be the most current at the moment (Chapters 10 and 11 of this manual contain additional reporting requirements).

A list of "serious incidents" requiring notification is contained in Appendix D of this manual (reference ICAO Annex 13, Attachment C).



5.3 NOTIFICATION PROCEDURES TO THE BUREAU AND OTHER STATES

5.3.1 The 24-hour Duty

5.3.1.1 The Bureau maintains a 24-hour-a-day Duty Officer to receive notifications of accidents and incidents. The Duty Officer uses a mobile phone for receiving notifications from within the country and to/from other States. Other modern communications facilities such as email and website are available as alternate systems in case the Duty Officer cannot be contacted for notifications. Paper copies of Aircraft Accident/Incident Reporting Form AIB.001 (appendix J1) or online copies can be accessed by all Aircraft operators and owners in Sierra Leone for use to report accidents or incidents.

5.3.1.2 The Commissioner will ensure that up-to-date contact and address information for reporting of accidents and incidents to the Bureau is available on the Bureau's website www.sl-aaib.com and to the Air traffic services (ATS) facilities, airport authorities, police, aircraft operators and any other stakeholders within or outside Sierra Leone.

5.3.2 Bureaus Contact Information on ICAO Website

5.3.2.1 The Commissioner is responsible to notify the ICAO of the contact information of the Bureau.

5.3.2.2 The contact information of the Bureau should include the following:

- a) Name of the Bureau
- b) Physical address of the Bureau, including Zip/Postal Code, if available
- c) Postal address, if available
- d) Telephone, Mobile and/or Facsimile
- e) Email address

5.3.2.3 If at any time the contact information of the Bureau changes, the Commissioner should, as soon as practicable, notify the Secretary General of ICAO of the new change(s) and the time the change will take effect. The new information should be sent through the email: icaohq@icao.int.

5.4 RESPONSE TO NOTIFICATIONS

5.4.1 Domestic Investigations

5.4.1.1 Upon receiving a notification of an occurrence of accident, serious incident or incident within Sierra Leone, the Duty Officer should immediately contact the reporting source to ensure that all the required information has been provided, to determine who and what organizations may have been involved in the occurrence, to determine who else has been informed of the occurrence, and to determine which actions have already been taken in response to the occurrence (Refer to appendix J0 – Report Receiving Checklist).

5.4.1.2 The Duty Officer should immediately alert the Commissioner and Investigation Division Manager of the preliminary information gathered on the occurrence from the reporting source.

5.4.1.3 Thereafter, the Duty Officer should contact the aircraft operator or owner of the aircraft involved in the occurrence to obtain further detailed information on the aircraft, the crew, dangerous goods and other information related to the flight using the Initial Actions after Notification checklist refer to Appendix K of this manual.



- 5.4.1.4 The commissioner or any officer assigned by him/her should immediately form a team, usually one or more experienced Investigators for:
- a) an immediate review of the information in the notification to ensure that all the required information has been provided (Appendix K of this manual is an example of the information that should be contained in a notification);
 - b) the collection of missing or additional information, as soon as possible;
 - c) the validation of the information collected, to the degree possible; and
 - d) an assessment of the information received and the circumstances of the occurrence to determine the classification of the occurrence (accident, serious incident or incident) and the scope and size of the investigation to be conducted.
- 5.4.1.5 Once the decision to launch investigation has been made by the Commissioner, the composition of the Go team must be determined immediately. The Commissioner or any officer assigned by him/her will select the Go Team members, including appointment of an IIC. An Investigator with extensive experience will be appointed as IIC. The investigation team members must prepare for immediate departure to the occurrence site. The Commissioner shall institute an investigation into the circumstances of all accident and serious incidents when the aircraft is of a maximum mass of over 2,250 kg and the Commissioner may delegate the whole or any part of the conduct of such investigation to another State or a regional accident and incident investigation organization by mutual arrangement and consent. The Commissioner may determine if the Bureau should conduct investigation into an incident as a form of training for the Investigators.
- 5.4.1.6 At present, the investigation of any accident will be delegated, in whole or part, to BAGAIA or another State. Therefore, the Commissioner should establish a Go Team to be deployed to the site of an accident and a serious incident for the purpose of securing the site and preserving perishable evidence and documenting the site pending the arrival of the investigators from the State delegated to conduct the investigation.
- 5.4.1.8 Each Investigator, as well as outside personnel used on a temporary basis, must be fully aware of their duties and responsibilities. All personnel on call should arrange their personal affairs such that they are able to depart to the site of an accident with a minimum of delay. Personnel should always ensure that they can be reached when on call.
- 5.4.1.9 The Duty Officer should contact the airline operator to obtain further details on the aircraft, its occupants and contents of cargo, specifically to determine if there were dangerous goods on board. If dangerous goods are carried on board, details of the dangerous goods such as type, nature, identification, quantity, packaging, location and documentation should be forwarded to IIC.
- 5.4.1.10 The Admin Officer should coordinate/forward the notification of interested parties such as airline operator, other Sierra Leone government agencies and relevant organizations, such as Sierra Leone Civil Aviation Authority (SLCAA), National Disaster Management Agency (NDMA), Aerodrome Fire Fighting and Rescue Services (AFFRS), Search and Rescue, Police, Road Safety, Sierra Leone Office of National Security (ONS), and other involved States, such as the States of Registry, Operator, Design, Manufacturer,



and/or International Civil Aviation Organization, when the aircraft involved is of maximum mass of 2,250 kg or is a turbojet-powered aeroplane. Notification and reporting to ICAO are also addressed in Chapter 11 of this manual. The notification shall be made with a minimum delay. The Duty Officer should use Reporting Checklist (AIB.01.02) in appendix J and Notification Form (AIB.01.03) in appendix L for this purpose.

5.4.1.11 The initial (and the amended initial) notification to other States and ICAO shall contain the following general information, if available, as per Sierra Leone Civil Aviation Regulations Part 13, Chapter 4, Section 4.4, subsection 4.4.1 (a):

- a) for accidents the identifying abbreviation ACCID, for serious incidents SINCID and incidents INCID;
- b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;
- c) name of owner, operator and hirer, if any, of the aircraft;
- d) qualification of the pilot-in-command, and nationality of crew and passengers;
- e) date and time (local time or UTC) of the accident or serious incident;
- f) last point of departure and point of intended landing of the aircraft;
- g) position of the aircraft with reference to some easily defined geographical point, and latitude and longitude;
- h) number of crew and passengers; aboard, killed and seriously injured; others, killed and seriously injured;
- i) description of the accident or serious incident and the extent of damage to the aircraft, so far as is known;
- j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;
- k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;
- l) identification of the originating authority and means to contact the Investigator-in-charge and the accident investigation authority of the State of Occurrence at any time; and
- m) presence and description of dangerous goods carried on board the aircraft.

Note. – Absence of complete preliminary information on the accident should not cause delay in notification. Any omitted details and/or other known relevant information shall be dispatched to/by the Bureau as soon as they are available. The Bureau shall forward details omitted during initial notification as soon as it become available.



5.4.1.12 The following is an example of accident notification using Appendix L.

EXAMPLE OF A NOTIFICATION	
Information required (ICAO Annex 13 paragraph 4.2)	Example
a) for accidents the identifying abbreviation ACCID, for serious incidents INCID	ACCID;
b) manufacturer, model, nationality and registration marks, serial number of the aircraft	Boeing 737-300, Sierra Leone, XX-ABC, Serial no. 2XXX
c) name of owner, operator and hirer, if any, of the aircraft	Anyone Airlines ltd
d) qualification of the pilot-in-command, and nationality of crew and passengers	Captain, Crew: Sierra Leone; passengers: unknown
e) date and time (local time or UTC) of the accident or serious incident;	7th October XXXX
f) last point of departure and point of intended landing of the aircraft	Lungi/FNA Freetown/ XXX
g) position of the aircraft with reference to some easily defined geographical point, and latitude and longitude ¹	12 km West of Lungi, 7°49'27"N, 6°04'41"E, elevation 2,200 m
h) number of crew and passengers; aboard, killed and seriously injured; others; killed and seriously injured; ²	6 crew and 57 passengers aboard: all fatally injured; others: none;
i) description of the accident or serious incident and the extent of damage to the aircraft, so far as is known;	Aircraft destroyed by fire
j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;	Full investigation by the SL-AAIIB
k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;	Mountainous area, difficult access, thick forest, wild animals
l) identification of the originating authority and means to contact the Investigator In charge and the accident investigation authority of the State Occurrence at any time, and	Sierra Leone Aircraft Accident and Incident Investigation Bureau, 4 th Floor (Right Wing), 21/23 Siaka Stevens Street, Freetown, Sierra Leone. For additional information, contact the following telephone numbers: +232-76-738632, and e-mail address: info@sl-aaib.com
m) presence and description of dangerous goods carried on board the aircraft	None

¹It may be helpful to provide the elevation of the accident site, if it is known.

²It is useful to first provide the number of persons aboard (crew, passengers) and then the injuries they sustained

Table 5.2 Example of a completed Notification Form



5.4.2 Deployment to accident/incident site

- 5.4.2.1 When information of the occurrence of an accident reaches the Bureau, The Commissioner shall dispatch Go Team to the accident site with minimum delay and by the quickest and available means of transportation. Investigator s should ensure that their Go kits and personal items are always available and ready to go.
- 5.4.2.2 The Admin Officer ensures travel arrangement, accommodation and Go kits are in place before the Go team embark on the journey to the site. The Admin Officer will also obtain technical information about the aircraft and passed unto the IIC before departure of the Go Team to accident site. The IIC should use the My Go Bag/ Pre-launch Checklist (SL-AAIB.01.08) to ensure all tools, equipment and documentations to be used at accident site are available, packed in suitable containers before leaving office.
- 5.4.2.3 Personnel assigned to respond to the accident site are obliged to reach the site as quickly and as safely as possible and to remain at the site until properly relieved. The Bureau presence at this time is essential to convey to the news media, local authorities, and the public that the investigation is under the Bureau jurisdiction. The only information released to the media should be that the Go Team is on its way to the site, name of media contact person and when the Go team is expected to arrive. Initial activities, in addition to those listed herein, should be aimed at gathering as much pertinent information as possible to brief the Commissioner and Go Team upon arrival.
- 5.4.2.4 Upon arrival at the site, the IIC should take over the site from police or other law enforcement agents on ground and to conduct risk assessment of the site using the Checklist AIB.01.06 (refer to Appendix I) as quickly as possible. The IIC will also ensure that adequate measures are taken to safeguard the wreckage and also organize the investigative activities of the individuals/groups assigned to the investigation.
- 5.4.2.5 As soon as the safety of the site is guaranteed, on-site investigation shall commence. Investigator s shall carry out preliminary investigation into the circumstances leading to the accident/incident using the applicable Bureau’s Checklists. It shall be mandatory for the investigators who carried out preliminary inquiries to brief the general investigation team on their findings for the purpose of participation consequent upon which investigation report may be produced; provided that the team shall be responsible for the accident/incident investigation to its logical conclusion.
- 5.4.2.6 Remoteness of the site or difficult accessibility does not diminish the need to establish Bureau’s jurisdiction. Every effort should be made to get to the site, even if environmental conditions preclude remaining at the site for any appreciable length of time.

5.4.3 Procedures for Notification to other States and ICAO

- 5.4.3.1 Upon receipt of report of an air occurrence that a decision had been made to conduct an investigation and following which the investigation team formed, including the Investigator-in-charge (IIC) had been appointed, the Duty Officer provide to the IIC all the information gathered so far.
- 5.4.3.2 The Duty Officer in coordination with the IIC should contact the airline operator whose aircraft was involved in the accident or serious incident to obtain detailed information about the aircraft, the flight, location and time of the occurrence, information on the casualties, flight crew, dangerous goods that might



be on board the aircraft, flight recorders, if installed and other relevant information related to the accident or serious incident.

- 5.4.3.3 The Duty Officer should input the preliminary information obtained from the reporting source and the airline operator into the initial Notification Form (SL-AAIIB.01.03).
- 5.4.3.4 The Duty Officer in coordination with the investigator-in-charge (IIC) should determine the entities within Sierra Leone to be informed of the occurrence and use the reporting checklist (SL-AAIIB.01.02) to identify the States and ICAO that should be notified of the occurrence. The addresses and contact information of the accident investigation authorities of other States are found by clicking the link: www.icao.int/safety/AIA/pages on the Bureau's website. The ICAO to forward the notification is adrep@icao.int.
- 5.4.3.5 The Duty Officer should consult with the Investigator-in-charge to ensure that the information contained in the notification form is accurate and complete. The Duty Officer should also prepare transmittal letters for the forwarding the initial notification forms to the States concerned. The transmittal letters shall invite the recipient States to appoint their accredited representatives to participate in the investigation.
- 5.4.3.6 The Duty Officer should submit the completed and validated initial notification form should be submitted to the Manager of investigation division as the case may be for approving the notification form and the associated transmittal letters.
- 5.4.3.7 The IIC should forward the approved initial notification form with transmittal letters to the States identified in paragraph 5.4.3.4 and ICAO without much further delay by using email. Lack of complete information at the early stage of the investigation should not prevent forwarding of the initial notification to the States concerned. When new details or more accurate information of the occurrence becomes available, the Duty Officer in coordination with the IIC should revise the notification form and resubmit to the States concerned as soon as possible.
- 5.4.3.8 The IIC should ensure that the relevant portions of the Initial Actions after Notification Checklist (SL-AAIIB.01.05) are filled with the required information.
- 5.4.3.9 The IIC should make copies of the initial notification forms (including revised notification if applicable) and the associated transmittal letters, any acknowledgement of receipt of the notifications and further correspondences from the recipient States and shall keep them in the investigation files. The investigation file shall be updated as more information is gathered until the completion of the investigation and publication of the final report.

5.4.4 Appointment of Observers/Participants

- 5.4.4.1 Observer or participant status is a privilege granted by the State conducting the investigation to a person having a direct interest in the investigation and who has the expertise to contribute to achieving the objective of the investigation. Among others, the following persons may be granted observer/participant status:
 - (a) persons representing a State department or agency,
 - (b) the aircraft owner and operator;



- (c) union or employee associations;
- (d) the flight crew involved in the accident.

- 5.4.4.2 An observer would be a representative of an involved government department or an employee of another State's Accident Investigation Authority, who is authorized by the Bureau to attend an investigation as an observer as a trainee Safety Investigator on the job or a Safety Investigator to keep currency on Safety Investigation skills.
- 5.4.4.3 A participant would be a person authorized by the Bureau to participate in an investigation because in the opinion of the Bureau that person has a direct interest in the subject matter of the investigation and has the expertise to contribute to achieving the Bureau's objective.
- 5.4.4.4 Any State that wishes its investigator to participate as an observer/participant in the investigation conducted by the Bureau shall make a written request to the commissioner, stating the name, qualification and experience of the candidate; and the justification therein,
- 5.4.4.5 The Commissioner may wish accept or reject the request. If the Commissioner accepts the request, he/she shall issue a letter of appointment in the name of the candidate. In this regard, the Bureau's Letter of Appointment that stipulates the terms and conditions of the observer/participant status should be signed by the Commissioner.
- 5.4.4.6 Upon arrival, of the observer/participant, the IIC should brief the observer/participant of the rights, privileges, limitations and responsibilities attached to participation in the investigation. An investigation observer/participant credential should be generated with the name and photo of the candidate (Refer to Appendix E for a Template Letter of Appointment). The IIC shall then handover the letter of appointment and the credential to the observer/participant for their signature as an indication of acceptance to participate in the investigation.
- 5.4.4.7 After the completion of the investigation or if observer/participant is withdrawn from the investigation, the holder of the credential shall return credential issued immediately to the IIC. the copies of letter of appointment and credential issued to observer/participant shall be kept in the investigation file by the IIC.

5.4.5 International Investigations

- 5.4.5.1 Upon receipt of an initial notification from another State about an accident or incident that occurred outside of Sierra Leone involving the country's interests (Sierra Leone -Registered, -Operated, -Designed, or -Manufactured aircraft), the Duty Officer shall acknowledge receipt. He/she should ensure that all the required information has been provided, to determine who and what organizations may have been involved in the occurrence, to determine who else has been informed of the occurrence, and to determine which actions have already been taken in response to the occurrence.
- 5.4.5.2 The Duty Officer shall inform the Commissioner immediately. The Commissioner will inform the interested parties within the country (airline operator, SLCAA, Ministry of Foreign Affairs and other relevant organizations) without much delay. Regardless of whether the Bureau's Investigator s intend to travel for an investigation in another State, the Commissioner or any officer designated by the Commissioner, should appoint an Accredited Representative (ACCREP) to participate in an investigation



of accident to an aircraft of a maximum mass of over 2,250 kg, when requested to do so by the State conducting the investigation.

- 5.4.5.3 The ACCREP will gather relevant materials and records related to the flight, crew, or aircraft, or any other material that may be of use to the accident investigation authority in the other State. Such materials should be forwarded to the IIC of the other State in a secure and expeditious manner.
- 5.4.5.4 The Commissioner may request the airline operator and the SLCAA to propose Advisers, who shall be technical specialists to assist the Accredited Representative. The advisers from the Bureau, the SLCAA and the airlines operator shall be responsive to the leadership of the ACCREP.
- 5.4.5.5 The names and contact details, as well the expected date of arrival, if the ACCREP and his team will travel to the State of Occurrence, shall be provided to the State of Occurrence. Advanced consideration should be given to passport requirement and travel facilities. Investigator s should always ensure that the investigation kits and essential personal items are ready.
- 5.4.5.6 The Accredited Representative will contact the operations division of the Airline Operator by the quickest means available, using the template letter (refer to Appendix E) to collect information on the flight, crew and the aircraft involved in the accident or serious incident, including details of dangerous goods carried on board the aircraft. If dangerous goods are carried on board, the ACCREP should obtain as much information about the nature, identification, marking, quantity, packaging, location and documentation of the dangerous goods. All the information gathered shall be provided to the State of Occurrence or State conducting the investigation as soon as practicable.
- 5.4.5.7 The following are policy provisions of the Sierra Leone Aircraft Accident and Incident Investigation Bureau:
 - a) As soon as possible after an accident or incident in Sierra Leone, the Bureau will forward an accident/incident notification to the other States involved and, when applicable, to ICAO. The Bureau will also subsequently dispatch details omitted from the initial notification as well as other known relevant information.
 - b) The Bureau will forward notifications in a timely manner with all available information in clear concise language prepared in English.
 - c) The Bureau will acknowledge receipt of notifications of accidents and incidents from other States.
 - d) The Bureau will provide the State conducting the investigation with, as applicable, any relevant information regarding the flight, crew and aircraft involved in an accident or incident as soon as possible.
 - e) The Bureau will notify the State conducting the investigation whether it intends to appoint an Accredited Representative and, if so, provide the details about travel and other arrangements.
 - f) If the Bureau is aware of dangerous goods on board an aircraft that has an accident or incident, the Bureau will ensure that it notifies the State conducting the investigation with the details of dangerous goods on board the aircraft by the most suitable and quickest means available.



5.4.5.8 The Bureau will maintain a record of all transmissions of notifications sent, responses received, and any follow-up correspondence in a tracking file system linked to each accident/incident file for future reference and follow-up actions.

Note — The Bureau will take into account the provisions of ICAO Manual on Assistance to Aircraft Accident Victims and their Families (Doc 9973) and Guidance on Assistance to Aircraft Accident Victims and their Families (Circular 285), regarding notifications and other matters pertaining to assisting family members of accident victims.

5.4.6 Appointment of Accredited Representative and Advisers

5.4.6.1 General

5.4.6.1.1 When an aircraft accident or serious incident occurs in another State, involving aircraft registered in Sierra Leone or operated by an Operator certified by Sierra Leone, that Bureau is entitled to appoint an Accredited Representative to the other State's investigation authority. By the same token, the investigating authority of that State may request the Bureau to appoint an Accredited Representative and Advisers.

5.4.6.1.2 The most important responsibility of the Accredited Representative is to provide constant and effective coordination between the investigating authority and the various interested parties - that is to ensure that new developments in the investigation are rapidly brought to the attention of the appropriate parties concerned with those developments. The Accredited Representative can be extremely useful in bringing the safety issues to the surface, and obtaining consensus on the analysis, findings and any proposed safety actions, if warranted. It must be remembered that in many cases, the Accredited Representative may be the most experienced person of the group. Typically, Preliminary Reports which bring strong dissenting opinions and responses from interested parties can usually be traced back to a less than ideal or required coordination on the part of the Accredited Representative.

5.4.6.1.3 The following phases cover both situations where the Accredited Representative may or may not be proceeding to the accident site. It is by no means exhaustive, but is intended to make the investigator aware of the basic investigative and administrative details that will enable him/her to start on the right foot.

- a) Prior to departure:
 - i) Get passport and visa requirement issues sorted out right away.
 - ii) If possible, verify if your cellular phone will function where you are going. Your cellular may not work in certain countries/States.
 - iii) Liaise with the Travels Unit to begin flight booking arrangements.
 - iv) Take a laptop computer; ensure it contains all necessary contact lists, forms, manuals.
 - v) Bring a digital camera, and know how to use and download pictures to e-mail.
 - vi) As a minimum, your field kit should contain the following: tape recorder & tapes, USB drives/portable drives, business cards, ICAO Annex 13 document, hard paper copies of various key forms.
 - vii) Bring appropriate clothing for the occasion; research on the internet the weather for the next week. Consider bringing one or more bio-hazard kits with you.
- b) Field investigation phase:
 - i) Remember that when you are the Accredited Representative, you are working for the IIC



- ii) Use standard ICAO investigation principles as required. Gather as much factual information as possible. Take ample notes. Record this data in the occurrence file.
 - iii) Review Annex 13 Chapter 5 for the entitlements of Accredited Representatives, and Advisers.
 - iv) Be aware of the sensitivity of collecting and transmitting data to/from Sierra Leonean entities. You require the IIC's permission before you release any information related to the occurrence. In particular, be conscious of Article 5.26 of ICAO Annex 13 related to release of information on the progress and findings of the investigation.
 - v) Send a daily report to Commissioner, if appropriate.
 - vi) Ensure advisers (if appointed) understand their responsibilities to provide formal reports to the investigative authority through you. This does not mean hindering their ability to work directly with the IIC, on or off site, for daily/routine investigative work.
 - vii) Ensure Advisers keep you abreast of uncovered issues which may affect the operation or certification of the aircraft/helicopter. Advise the regulator of such without delay.
 - viii) The Accident Representative may be requested by the State of Occurrence to provide factual reports and copies of your notes. Ensure that you only include validated factual information in these reports.
 - ix) The Accident Representative may be requested to provide a report containing analysis. Because what you provide will be considered as the official Bureau's position on an issue, your documented analysis is to be reviewed by Bureau's Headquarters before it is released to the State conducting the investigation.
 - x) Be aware that all email correspondence with the IIC/investigation authority will be public and may be included in an appendix to the final report.
- c) Follow-on duties:
- i) The Accredited Representative may be requested by the State of Occurrence to assist in the analysis portion of the report, and in some cases, may be involved in the drafting of analysis, findings and causes. Because what you provide will be considered as the official position on an issue, your documented analysis is to be reviewed by Bureau's Headquarters before it is released to the State conducting the investigation. It is equally important to provide your advisors the opportunity to comment on such a report.
 - ii) Keep abreast of findings, safety issues/deficiencies and planned safety action by the investigating authority, and close the loop with the SLCAA and all government entities involved.
 - iii) Ensure Advisers' reports are forwarded to the IIC. You can ask that these be sent through you, but you do not have the authority to demand it.
- d) Investigation Reports:
- i) Ensure that the IIC is aware that, in accordance with the provision of ICAO Annex 13, your government expects to have an opportunity to comment on his investigation report prior to the report being made public. Also inform the IIC that you would like to involve affected local entities in this review.
 - ii) Some States release a Preliminary Report which contains factual information about the occurrence, and request comments from the Accident Representative. The Accident Representative is authorized to make representation directly to the IIC on the accuracy of this factual information.
 - iii) When requested to comment on the draft Final Report or any other report containing analysis:



Unless prohibited by the IIC, consult with all involved entities.

Prepare comments and forward them to the manager of investigation department.

The Commissioner will sign the response letter.

- e) End of Investigation:
 - i) Ensure that a complete occurrence file is sent to Bureau's Headquarters records.
 - ii) Ensure that all required information is entered into the database.

5.4.6.2 Appointment of an Accredited Representative

5.4.6.2.1 If, Sierra Leone is the State of the Operator, the State of Registry, the State of Design or Manufacturer of an aircraft involved in an accident or serious incident in another State and:

- a) The aircraft involved in the accident is of a maximum mass of over 2 250 kg when the State conducting the investigation had requested the Bureau to appoint an accredited representative to participate in the investigation; or
- b) The Bureau had received notification of an accident or serious incident from the State of Occurrence. the Commissioner should as soon as practicable appoint an accredited representative to participate in the investigation being led by another State.

5.4.6.2.2 The accredited representative would normally be preferably a qualified senior investigator from the Bureau to represent the interests of Sierra Leone during the investigation led by another State.

5.4.6.2.3 The selection criteria of a suitable candidate should consider the nature, type and complexity of the accident/serious incident to be investigated, knowledge and understanding of the international accident and incident investigation practices, particularly ICAO Annex 13.

5.4.6.2.4 The Commissioner shall issue a formal letter of appointment to the successful candidate detailing rights and privileges of an accredited representative in accordance with Annex 13.

5.4.6.2.5 The Commissioner should inform the Ministers responsible for civil aviation and the foreign affairs of the appointment of an accredited representative and advisers to represent Sierra Leone in an investigation conducted by another State, if necessary.

5.4.6.2.6 The name and contact details of the accredited representative (and advisers, if applicable) should be forwarded to the State conducting the investigation stating whether the accredited representative will travel to the site. If the accredited representative intends to travel to the site, the arrival information should also be provided to the State.

5.4.6.3 Appointment of Advisers

5.4.6.3.1 If Sierra Leone is the State of the Operator or the State of Design or Manufacturer of an aircraft involved in an accident or serious incident and Accredited Representative has been appointed by the Commissioner to participate in the investigation being led by another State, the Commissioner will as



soon as possible, request the airline operator/owner, the SLCAA and as applicable, the organisation responsible for type design and the final assembly of the aircraft to nominate one or more Advisers on the basis of their qualifications and expertise to assist and make the participation of the Bureau's Accredited representative effective in an investigation led by another State.

- 5.4.6.3.2 The airline operator/owner, SLCAA or the organization responsible for type design and final assembly of the affected aircraft shall be required to within the shortest possible time, to submit the name(s) and qualifications of its proposed Adviser(s) to the Commissioner so as to avoid delay in formation and timely participation of the Bureau's team.
- 5.4.6.3.3 As soon as the nominees' details have been received by the Bureau, the Commissioner or any officer assigned by him/her shall appraise the credentials of the proposed Adviser(s) to ensure they possess the required qualifications and expertise.
- 5.4.6.3.4 Upon satisfactory assessment of the nominees, the Commissioner should appoint the nominees to serve as Advisers to accompany the Bureau's Accredited Representative to participate in an investigation of accident or serious incident led by another State.
- 5.4.6.3.5 The letter of appointment should be issued to the adviser stating the rights and privileges of an adviser to accompany the Sierra Leone' accredited representative to make effective participation in an investigation conducted by another State.
- 5.4.6.3.6 The name and contact information of the adviser should add to the information being forwarded to the State conducting the investigation in 5.4.6.2.6 above.

5.4.7 Appointment of Experts

- 5.4.7.1 In the event of aircraft accident which occurred in another State and in which Sierra Leone citizens suffered fatalities or serious injuries, the Bureau may upon receiving request from the State conducting the investigation, appoint an Expert to participate in the investigation. In this regard, the Bureau will make necessary arrangement to provide relevant details of the expert including name, organization, address, by whom he/she will be accompanied and their mandate.
- 5.4.7.2 The Commissioner or any official assigned by him/her will appoint an experienced medical specialist, preferably a pathologist or a physician who specializes in Aviation Pathology as the Bureau's Expert to participate in the investigation conducted by another State.
- 5.4.7.3 If circumstances permit, the Bureau's expert will be accompanied by a senior safety investigator of the Bureau, who possess vast knowledge of international investigations. An identification specialist or a representative of the Association of the families of the accident victims, if available may be enlisted to accompany the expert.
- 5.4.7.4 The manager of Admin and Finance should make expedited travel arrangement to facilitate early arrival of the expert and his team to the accident site.
- 5.4.7.5 The Bureau's expert is entitled to:



- a) visit the scene of the accident;
- b) have access to the relevant factual information approved for public release by the State conducting the investigation and information on the progress of the investigation;
- c) assist in the identification of the victims;
- d) attend meetings with Sierra Leone survivors of the accident; and
- e) receive a copy of the Final Report.

5.4.7.6 Before leaving for the accident site, the Bureau's expert should:

- a) consult with the Investigator-in-charge to determine what arrangements may have been concluded with the coroner,
- b) the attorney-general or the police;
- c) conclude an agreement with medical authorities on the time and method of recovering human remains, autopsies and physical examinations of surviving crew members;
- d) attend the Investigator-in-charge's pre-departure briefing; and
- e) submit all original documents to the Commissioner.

5.4.7.7 After arrival at the accident site, the expert should:

- a) contact the local coroner or appropriate medical authority to determine the progress at the accident site;
- b) conduct a preliminary survey of the accident site in order to get a feel for the dynamics of the accident;
- c) attend the Investigator-in-charge's organizational meeting;
- d) obtain the passenger manifest;
- e) collaborate with the coroner and police authorities in the identification of victims;
- f) as appropriate, assist in providing victim identification information such as wallets, clothing, jewellery, age, sex, face, complexion, color of hair and eyes, height, weight, dental records, scars, growths, skeletal deformities, medical disorders, tattoos, blood group, identification tags and medical files;
- g) consult with medical authorities regarding the location and time of autopsies; and
- h) advise coroner or attorney general of tests required on remains, including human fluids and tissue specimen requirements.

5.4.7.8 The expert should submit comprehensive report to the Commissioner upon completion of the mission.



5.5 DELEGATION OF THE INVESTIGATION (IN WHOLE OR IN PART)

- 5.5.1 Part IX Section 82(1)(b) of the Sierra Leone Civil Aviation Act empowers the Commissioner of SL-AAIIB to institute and conduct investigation into the circumstances of civil aircraft accidents and incidents which occur within the territory of Sierra Leone in line with Annex 13 of the Chicago Convention. As the Bureau is a newly established accident investigation authority, it lacks the qualified technical personnel and equipment to conduct annex 13 investigation of aircraft accidents and serious incidents as required by the Act. Part IX Section 82(1)(c) of the Sierra Leone Civil Aviation Act - provides provision that the Commissioner of SL-AAIIB may delegate a whole or any part of an investigation of aircraft accident or serious incident to another State or to a RAIO, based on mutual arrangement and consent.
- 5.5.2 In order to ensure availability of external resources to enable the conduct of investigation of accidents and serious incidents, the Bureau may make arrangement in form of memoranda of understanding (MoUs) for the delegation in whole or part of the conduct of an investigation to any of the accident investigation authorities of the States that have the expertise and equipment required for investigation such as Nigeria or investigation authorities of the States of Manufacture and States of Design of the aircraft that are operated into Sierra Leone.
- 5.5.3 The Bureau has signed MoU with the SLCAA for secondment of qualified technical personnel to assist the Bureau during formation of its Go team in the event of a major accident. The Bureau shall benefit from the MoU signed between the SLCAA and (Sierra Leone Maritime Administration, National Disaster Management Agency) for assistance in the event of crash of aircraft into the sea, land and difficult terrains.
- 5.5.4 The SL-AAIIB is a Member State of Banjul Accord Accident Investigation Agency (BAGAIA), and stands to enjoy tremendous benefits in the areas of technical opportunities, sharing of technical expertise and equipment for conducting investigation of aircraft accident and serious incident.
- 5.5.5 In addition to their roles in securing and documenting the accident site, the wreckage and the evidences, the Bureau's Investigator(s) should be allowed to participate in the conduct of the investigations as observers subject to the powers and directions of the Investigator-in-charge (IIC) to serve the purpose of their practical on-the-job-training (OJT).
- 5.5.6 Each working arrangement for the delegation of the whole or a part of the conduct of investigation to another State or BAGAIA should be documented in a form of Agreement or Memorandum of Understanding (MoU) in line with Appendix 9 to Chapter 2 of ICAO Doc 9756 Manual of Aircraft Accident and Incident Investigation Part I Organization and Planning. The investigation delegation agreement should be legally binding on the parties to the agreement. The deliverables of the agreement (e.g. the Final Report in case of a whole investigation delegation, or a factual/examination report in case of delegation of part of the investigation) are to be documented in the agreement.
- 5.5.7 Depending on the scope of the delegation, the investigation delegation agreement should include all or part of the following sections:



- a. Introduction. This section should contain a short description of the accident or serious incident; identification of the involved accident investigation authorities; the scope of the delegation (whole investigation or part of the investigation); and verification of conformity with Annex 13 to the Chicago Convention.
- b. Terminology. This section defines specific terms used in the agreement, as applicable, and indicates that words and phrases used in the agreement have the same meaning as that ascribed to them in Annex 13 — *Aircraft Accident and Incident Investigation*.
- c. Objective of the investigation. This section should contain the following statement: “In accordance with Annex 13 to the Chicago Convention, the sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability.”
- d. Conduct of the investigation. This section should contain the following statement: “This Agreement serves to foster cooperation and mutual assistance between the parties in implementing the provisions of Annex 13. Each party shall strive to overcome difficulties that may arise due to differences in language, national culture, legislative system or geographic location.” This section also addresses the protection of investigation records and terms where an investigation may need to be reopened due to the emergence of new and significant evidence.
- e. Participation of other States. This section should describe the States entitled to appoint an accredited representative to participate in the investigation. The State of Occurrence is entitled to appoint an accredited representative when it delegates the whole investigation.
- f. Scope of the investigation and reporting responsibilities. This section should mention the scope of the investigation delegation, stating whether the investigation is delegated in whole, or in part, and the responsibilities for the reporting requirements prescribed in Annex 13 to the Chicago Convention. When the investigation is delegated in part, the delegated parts should be listed.
- g. Miscellaneous. This section should contain procedures to be followed by both parties, such as: means of exchanging records, evidence and information; managing post-accident communication; provision of assistance to accident victims and their families; and tracking of safety recommendations stemming from Final Reports.
- h. financial considerations. This section should mention the party or parties responsible for covering the costs and expenses associated with the investigation.
- i. Coordination. This section should provide a contact person in each party for coordination of investigation issues.
- j. Dispute. This section should contain the following statement: “If any dispute arises in respect of the interpretation or execution of the terms of this Agreement, such dispute should be settled mutually by the parties.”
- k. Entry into force, termination and reactivation. This section should state the agreement effectivity terms such as the dates in which the agreement comes into effect and its termination; conditions of termination; and reactivation of the agreement when the investigation needs to be reopened.



1. Notification of the agreement to ICAO. This section should require both parties to inform the ICAO headquarters of the investigation delegation agreement.

5.6 GUIDANCE ON CONDUCTING FLIGHT RECORDER REPLAY AND ANALYSIS AT FACILITIES OF OTHER STATES

5.6.1 General

- 5.6.1.1 The Bureau does not have the facility for the read-out of flight recorders and does not have the capability for analysis of the recordings of the flight recorders.
- 5.6.1.2 The read-out and analysis of the flight recorders shall be delegated to another State with recorder read-out capabilities. The choice of the read-out facility will be done in accordance with guidance in this section same as contained in Attachment D to Annex 13 - *Guidelines for Flight Recorder Read-out and Analysis*.
- 5.6.1.3 The Commissioner will identify a number of read-out and analysis facilities in other States to enter into MoU in order to ensure timely read-out and analysis of recordings of the flight recorders.
- 5.6.1.4 The Commissioner shall ensure that the flight recorders are taken to the selected read-out facility as soon as practicable. In this regard, the Commissioner give utmost priority to undertaking the read-out and analysis of the flight recorders by providing the needed financial resources to either hand-deliver the flight recorders or shipping the flight recorders to the read-out facility. All necessary transport and logistic arrangements shall be readily available.
- 5.6.1.5 It is preferable that the IIC and a flight recorder specialist travel with the flight recorders and be physically present during the entire process of the read-out and analysis. However, if the IIC or the flight recorder specialist, for lack of visas or lack of qualified personnel or other administrative reasons, is unable to travel to the facility to be present during the read-out of the flight recorders, the Commissioner shall ship the flight recorders to the read-out facility and request that an investigator of the Accident Investigation Authority of that State be present during the process.
- 5.6.1.6 The Commissioner shall ensure prior arrangement is made through the instrument of MoU to establish cooperation with the judicial authorities in the event of conduct of parallel investigations, including determining custody of the flight recorders, the need to speedily ship the flight recorders to a facility for read-out and analysis in another State, who shall be present during the read-out and analysis of the recorders.
- 5.6.1.7 Overall, the Commissioner shall ensure that neither administrative, financial nor judicial processes impede the timely read-out and analysis of the flight recorders.

5.6.2 Initial Response

- 5.6.2.1 It is essential that flight recorders be read out as early as possible after an accidents or serious incidents. Early identification of problem areas can affect the investigation at the accident site where evidence is sometimes transient. Early identification of problem areas may also result in urgent safety recommendations which may be necessary to prevent a similar occurrence.



5.6.2.2 In some cases, the recorder may need to be taken to its manufacturer for read-out. In such cases, the work will normally be supervised by our Investigator, or an Investigator from another State to ensure that there is no real or perceived conflict of interest.

5.6.3 Choice of facility

Facilities for the read-out of flight recorders should have the ability to:

- a) Disassemble and read-out of the flight recorders that have sustained substantial damage;
- b) Playback the original recording/memory module without the need for the use of a manufacturer's copy devices or the recorder housing that was involved in the accident or incident;
- c) Manually analyse the raw binary waveform from digital tape flight data recorders;
- d) Enhance and filter voice recordings digitally by means of suitable software; and
- e) Graphically analyse data, derive additional parameters not explicitly recorded, validate the data by cross-checking and use other analytical methods to determine data accuracy and limitations.

5.6.4 Participation by the State of Manufacture (or Design) and the State of the Operator

5.6.4.1 The Bureau understands that the State of manufacture (or Design) has airworthiness responsibilities and the expertise normally required to read out and analyse flight recorder information. Since flight recorder information can often reveal airworthiness problems, it is expected that the State of manufacture (or Design) should have a representative present when the flight recorder read-out and analysis are being conducted in a State other the State of Manufacture (or Design).

5.6.4.2 The Bureau also understands that State of the Operator has regulatory responsibilities regarding the flight operation and can provide insights into operational issues which may be specific to the operator. Since flight recorder information can reveal operational problems, it is expected that the State of the Operator should also have a representative present when the flight recorder read-out and analysis are being conducted.

5.6.5 Procedures for the flight recorder read-out

5.6.5.1 The flight data recorder and the cockpit voice recorder should be read out by the same facility, because they contain complementary data which can help validate each recording and aid in determining timing and synchronization.

5.6.5.2 The flight recorders should not be opened or powered up and original recordings should not be copied (particularly not by high-speed copy devices) prior to the read-out because of the risk of damage to the recordings.

5.6.5.3 The facility at which the flight recorders are read out for another State should be given an opportunity to comment on the Final Report in order to ensure that the characteristics of the flight recorder analysis have been taken into consideration.



- 5.6.5.4 The facility at which the flight recorders are read out may require the expertise of the aircraft manufacturer and the operator in order to verify the calibration data and validate the recorded information. Thus, facilitating the participation of the State of Design, State of Manufacture and State of the Operator.
- 5.6.5.5 The Bureau may leave the original recordings, or a copy of them, with the read-out facility until the investigation is completed, in order to facilitate the timely resolution of additional requests or clarifications, providing that the facility has adequate security procedures to safeguard the recordings.



CHAPTER 6 - INVESTIGATION POLICIES AND PROCEDURES

- 6.0.1 Accident investigation is a systematic process whereby all of the possible causes of an adverse event are evaluated and eliminated until the remaining causes are identified as applicable to that investigation. Furthermore, during the investigation, if other deficiencies are identified that were not part of this accident, the investigation team should note them and provide this information to the applicable authority, even though it may not become part of the official investigation report.
- 6.0.2 Although many accidents appear to be similar to others, this may be misleading. Therefore, it is imperative that investigators keep an open mind so as not to focus on one aspect and thus overlook another. Because accidents are infrequent, investigators must take every opportunity to obtain training with air carriers, military, aircraft manufacturers and other accident investigators so as to retain currency and acquire the best methods for investigation. Many large air carriers and aircraft manufacturers have established accident investigation resources that should be consulted in support of periodic training. Air carriers and aerodromes conduct periodic emergency exercises, and these also provide an opportunity for the accident investigators to utilize these scenarios for training.
- 6.0.3 In the event of an actual accident or serious incident, these relationships will be useful to the investigators in efficiently determining the causes.

Investigation of accidents consists of three phases:

- a) collection of data;
 - b) analysis of data; and
 - c) presentation of findings.
- 6.0.4 The initial phase of the investigation process should focus on defining and obtaining data relevant to the accident. In particular, highly perishable data should be given priority. Data collection will often develop into an on-going process as more is learned about events surrounding the accident. Therefore, data collected early in the investigation may be combined with other data collected at later stages as a method of reaffirming and validating possible contributing factors. Types of data to be collected include:
- a) accident particulars;
 - b) meteorological;
 - c) technical; and
 - d) human factors.



6.1 GENERAL

- 6.1.1 This chapter of the manual contains general policies and procedures of the Bureau that are consistent with the requirements and guidance provided by ICAO, as well as the best practices of the accident investigation authorities in some other States. The Civil Aviation Act of Sierra Leone, Sierra Leone Civil Aviation Regulations, Part 13 – Aircraft Accident and Incident Investigations, provide the legislative and regulatory basis for the policies and procedures contained herein. Many of the following policy and procedural matters are taken directly from ICAO documents and have been accepted by the Bureau as its own.
- 6.1.2 It is the policy of the Bureau to institute an investigation into the circumstances of all aircraft accidents and incidents falling under the authority and responsibilities entrusted to it by the government. Such investigations should be conducted in accordance with the provisions of ICAO Annex 13 and Sierra Leone laws and regulations.
- 6.1.3 The Bureau will be involved in civil aircraft accident/incident investigation in the following circumstances:
- a) Where the accident or serious incident occurs within the territory of Sierra Leone irrespective of the nationality of the aircraft;
 - b) If Sierra Leone, having suffered fatalities or serious injuries to its citizens, the Bureau will appoint an expert to participate in the investigation;
- 6.1.4 It is the policy of the Bureau to determine the extent of the incident investigation and the procedures to be followed in carrying out such an investigation, depending on the lessons it expects to draw from the investigation for the improvement of safety, the Bureau will use the opportunity as a means of training for its personnel. The scope and complexity of the investigation and the size and composition of the investigation team should be influenced by the following factors, among others:
- a) identified and potential safety issues underlying the occurrence;
 - b) the likelihood of recurrence, the probability of adverse consequences, and the severity of adverse consequences;
 - c) accident and incident history related to the type of operation, size and type of aircraft, the operator, manufacturer, regulator, etc.; and
 - e) actual and potential deviations from industry safety and operational regulations, standards, procedures, and practices.
- 6.1.5 It is the policy of the Bureau to conduct investigations and complete reports for all accidents and incidents, including the type of serious incidents listed in ICAO Annex 13, Attachment C (Refer to appendix D of this manual). It may also conduct selected investigations of other incidents not listed in ICAO Annex 13 if it finds that certain safety lessons can be learnt from investigating the circumstances of the incident.

Note. — The Bureau has an arrangement (MoU) with the Sierra Leone Civil Aviation Authority (SLCAA) to be notified of all occurrences (accidents and incidents), including air traffic and mechanical failure incidents, so that the Bureau can determine if it should conduct an independent investigation. Most of the incident notifications are generated by the SLCAA mandatory occurrence reporting (MOR) system.



- 6.1.6 Upon notification of an occurrence, the Commissioner or any officer assigned by him/her will immediately constitute a team of expert-investigators to conduct preliminary assessment of the occurrence to determine if it falls within the jurisdiction of the Bureau as follows:
- a) if the occurrence is classified as a Serious Incident or
 - b) if the occurrence is classified as an accident.
- 6.1.7 When the occurrence is classified as an accident or serious incident the Bureau may consider calling upon an aircraft accident investigation authority of another State for assistance and/or other relevant aviation stakeholders on the basis of mutual agreements. The Bureau may further consider proposing the delegation of the whole investigation or parts thereof to an aircraft accident investigation authority in another State, or a regional accident investigation organization, should the circumstances of an occurrence so warrant.
- 6.1.8 If during the course of an investigation, the Bureau becomes aware of, or suspects, unlawful interference (sabotage or other crime), the IIC shall immediately notify the Commissioner, who shall immediately notify the head of Aviation Security of the Sierra Leone Civil Aviation Authority (SLCAA), being the appropriate authority of aviation security in Sierra Leone. The Bureau will continue the safety investigation to the extent necessary, parallel with any criminal investigation will furnish requested assistance to judicial authorities and will complete a Final Report of the occurrence, in accordance with ICAO Annex 13, keeping in mind continued cooperation with the judicial authorities. The IIC should explain the Bureau's procedures and the criticality of preserving and documenting certain forms of evidence. If any problems are encountered in this type of accident investigation, the Commissioner should be consulted.
- 6.1.9 The Bureau will also consider electronic equipment other than flight recorders, which may contain valuable information related to the accident. Such equipment includes as quick access recorder (QAR), full authority digital engine control (FADEC), health and usage monitoring system (HUMS), satellite navigation units (e.g. global positioning system (GPS), Global Navigation Satellite System (GLONASS), ground proximity warning system (GPWS), terrain awareness and warning system (TAWS), flight management system (FMS), ATC Radar). Analyses of these units can significantly help the investigation, especially in the absence of information from the flight recorders. In addition, the Bureau may consider seeking expert assistance from the relevant States of Manufacture.
- 6.1.10 The Bureau will complete, publish and publicly release a Final Report of the investigation in accordance with ICAO Annex 13 requirements, consistent with the complexity and safety issues involved in the occurrence. When safety deficiencies are identified during the course of an investigation, the Bureau will encourage relevant organizations (airlines, airports, manufacturers, regulators, ICAO, when ICAO documents are involved, etc.) to take immediate safety action to prevent recurrence. If necessary, the Bureau will issue safety recommendations to the organization(s) in a position to take safety action. Chapter 10 of this manual contains further details about the report writing and safety recommendations.

6.2 EXTEND AND SCOPE OF INVESTIGATION

6.2.1 Guidance on determination/classification of occurrences

Soon after the Bureau receives a report of an occurrence, the Commissioner or designated personnel of the Bureau will institute and conduct preliminary assessment of the report to determine if it is an accident, serious incident or just an incident using the criteria set in the paragraphs 6.2.1.1 and 6.2.1.2 below.



6.2.1.1 Determination/ Classification of Occurrence to an Accident

6.2.1.1.1 For an occurrence to be classified as an aircraft accident, the following condition must be fulfilled:

- a) a person is fatally or seriously injured as a result of:
 - i. being in the aircraft, or
 - ii. direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
 - iii. direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- b) the aircraft sustains damage or structural failure which:
 - i. adversely affects the structural strength, performance or flight characteristics of the aircraft, and
 - ii. would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or
- c) the aircraft is missing or is completely inaccessible.

6.2.1.1.2 For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

6.2.1.1.3 Guidance for the determination of aircraft damage is as follows:

- a) If an engine separates from an aircraft, the event is categorized as an accident even if damage is confined to the engine;
- b) A loss of engine cowls (fan or core) or reverser components which does not result in further damage to the aircraft is not considered an accident;
- c) Occurrences where compressor or turbine blades or other engine internal components are ejected through the engine tail pipe are not considered accidents;
- d) A collapsed or missing radome is not considered an accident unless there is related substantial damage in other structures or systems;
- e) Occurrences of missing flaps, slats and other lift augmenting devices, winglets, etc., that are permitted for dispatch under the Configuration Deviation List (CDL) are not considered accidents;
- f) Retraction of a landing gear leg or wheels-up landing, resulting in skin abrasion only, when the aircraft can be safely dispatched after minor repairs or patching, and subsequently undergoes more extensive work to effect a permanent repair, would not be classified as an accident;



- g) If the structural damage is such that the aircraft depressurizes, or cannot be pressurized, the occurrence is categorized as an accident;
- h) The removal of components for inspection following an occurrence, such as the precautionary removal of an undercarriage leg following a low-speed runway excursion, while involving considerable work, is not considered an accident unless significant damage is found;
- i) Occurrences that involve an emergency evacuation are not counted as accidents unless someone receives serious injuries or the aircraft has sustained significant damage.

Note 1.— Regarding aircraft damage which adversely affects the structural strength, performance or flight characteristics, the aircraft may have landed safely, but cannot be safely dispatched on a further sector without repair.

Note 2.— If the aircraft can be safely dispatched after minor repairs and subsequently undergoes more extensive work to effect a permanent repair, then the occurrence would not be classified as an accident. Likewise, if the aircraft can be dispatched under the CDL with the affected component removed, missing or inoperative, the repair would not be considered as a major repair and consequently the occurrence would not be considered an accident.

Note 3.— The cost of repairs, or estimated loss, such as provided by insurance companies may provide an indication of the damage sustained but should not be used as the sole guide as to whether the damage is sufficient to count the occurrence as an accident. Likewise, an aircraft may be considered a “hull loss” because it is uneconomic to repair, without it having incurred sufficient damage to be classified as an accident.

6.2.1.1.4 An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

6.2.1.2 Determination/ Classification of Occurrence to a Serious Incident using Risk Analysis

6.2.1.2.1 The term “serious incident” is defined as an incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an Unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

6.2.1.2.2 There may be a high probability of an accident if there are few or no safety defences remaining to prevent the incident from progressing to an accident. To determine this, an event risk-based analysis (that takes into account the most credible scenario had the incident escalated and the effectiveness of the remaining defences between the incident and the potential accident) can be performed as follows:

- a) consider whether there is a credible scenario by which this incident could have escalated to an accident; and
- b) assess the remaining defences between the incident and the potential accident as:
 - i. effective, if several defences remained and needed to coincidentally fail; or



- ii. limited, if few or no defences remained, or when the accident was only avoided due to providence.

6.2.1.2.3 Consider both the number and robustness of the remaining defences between the incident and the potential accident.

Ignore defences that failed, and consider only those that worked and any subsequent defences still in place.

Note 1.— The most credible scenario refers to the realistic assessment of injury and/or damage resulting from the potential accident.

Note 2.— Defences include crew, their training and procedures, ATC, alerts (within and outside the aircraft), aircraft systems and redundancies, structural design of the aircraft and aerodrome infrastructure.

6.2.1.2.4 The combination of these two assessments helps to determine which incidents are serious incidents:

		b) Remaining defences between the incident and the potential accident	
		Effective	Limited
a) Most credible scenario	Accident	Incident	Serious Incident
	No accident	Incident	

6.2.1.2.5 The incidents listed in Appendix D of this manual are examples of what may be serious incidents. However, the list is not exhaustive and, depending on the context, items on the list may not be classified as serious incidents if effective defences remained between the incident and the credible scenario.

Note 1.— The most credible scenario refers to the realistic assessment of injury and/or damage resulting from the potential accident.

6.2.2 Types and Scope of the Investigation

6.2.2.1 General

6.2.2.1.1 It is essential that the magnitude of the tasks and the scope of the investigation be assessed at an early stage so that the size of the safety investigation team can be planned, and the appropriate expertise can be acquired for the investigation. To achieve its purpose, the investigation should be properly organized, carried out, coordinated and supervised by qualified technical personnel.

6.2.2.1.2 Based on the assessment of the information contained in the notification and any other information available, the Commissioner or any officer assigned by him/her must first decide on the type and scope of investigation and appoint the Investigator-in-charge, depending on the circumstances of the accident, serious incident and the safety lessons that the Bureau expects to draw from the investigation for the



improvement of safety and a means of training in capacitating its personnel. The scope of the investigation, the size and composition of the investigation team would be decided by the:

- a) injuries, deaths and damage to equipment, third parties and the environment;
- b) identified and potential safety issues underlying the accident/incident;
- c) the likelihood of recurrence, the probability of adverse consequences, and the severity of adverse consequences;
- d) accident and incident history related to the type of operation, size and type of aircraft, the operator, manufacturer, and regulator; and
- e) actual and potential deviations from industry safety and operational regulations, standards, procedures and practices.

6.2.2.1.3 The Manager of investigation division in coordination with the IIC shall be responsible for organizing the investigation team and for assigning responsibilities to its members.

6.2.2.1.4 Throughout the investigation, the Investigator-in-charge will manage the progress of the investigation. Specifically, the Investigator-in-charge must review the evidence as it is developed and make decisions that will direct the extent and depth of the investigation. It should be recognized that the precise extent and depth will be contingent upon the nature of the occurrence and, possibly, upon the availability of investigative resources.

6.2.2.1.5 Similarities between occurrences may tempt the unwary to arrive at premature conclusions. It is imperative that each investigation be approached individually based on the circumstances of the occurrence. Based on the evidence uncovered by the on-site investigation, it may be possible to eliminate certain areas from possible causal consideration at a fairly early stage during the investigation. As the investigation progresses, however, the need for extensive studies in one or more particular fields might become evident. It should be noted that this later statement or the various sections of this manual that follow are not intended to convey the impression that extensive technical studies need to be performed in every investigation or that every investigation needs to cover every aspect of the aircraft and its operation.

6.2.2.2 Determining the Scope of Major Accident investigations

6.2.2.2.1 In a major accident investigation, a substantial team of investigators is usually necessary to cover all aspects of the occurrence. The Investigator-in-charge should establish working groups, as required, to cover various functional areas of the investigation. Normally, investigators from the delegated State will head the various working groups. The membership of such groups may include, as appropriate, other personnel of the SL-AAIIB, as well as experts from the operator and the manufacturers of the aircraft, Powerplant and accessories, who can contribute their technical knowledge and experience to the investigation. The number of groups, and the number of personnel assigned to each group, will depend on the type and complexity of the accident. Refer to section 8.2.2 in Chapter 8 of this manual for detailed major investigation management process.

6.2.2.2.2 Nothing precludes using the major accident investigation procedures for the investigation of serious incidents or accidents involving a small aircraft.



6.2.2.2.3 In some investigations, the apparent causes/contributing factors may become evident early in the investigation. In such situations, the subsequent prime investigative effort may then be channeled to good effect into a relatively narrow but specialized area. Nevertheless, it will still be necessary to investigate all factors that might have contributed to the accident and to eliminate those factors that did not. In situations wherein the causes are not readily apparent, the investigator must progress steadily through all aspects of the occurrence, and this type of situation may require substantive effort of many groups of investigators working in a balanced and coordinated manner.

6.2.2.3 Determining the Scope of Smaller Investigations of Incidents and Accidents

6.2.2.3.1 In the case of incidents and non-major accidents, the investigative effort required in terms of manpower and resources may be proportionately smaller than that required for a major accident. In such situations, the smaller investigation might be handled by one or two investigators. One group of investigators can be assigned responsibilities normally assigned to two or more groups, or alternatively, one trained investigator can conduct the investigation assisted by one or more subject-matter experts.

6.2.2.3.2 Most investigations into serious incidents may be conducted by a small investigation team. Notwithstanding, this does not preclude investigating a serious incident using a larger investigation team and following the guidance for major investigations contained in section 8.2.1 in Chapter 8 of this manual.

6.2.2.3.3 Even in small investigations, the degree of individual effort and diligence in accurately recording the facts and developing the analysis and conclusions must be of the same high standards as for major accident investigations.

6.3 RIGHTS, AUTHORITY AND OBLIGATIONS OF INVESTIGATORS

The Bureau's Investigators have the following rights and authority, which are consistent with Sierra Leone's obligations under ICAO Annex 13 to the Chicago Convention:

- a) Unhampered access and control over an aircraft accident site and any wreckage thereon.
- b) Unhampered access and control over all relevant accident/incident investigation materials, evidence, documents, etc., including air traffic service (ATS) recordings and recorders.
- c) The right to conduct detailed examination and testing of relevant material/evidence without delay or interference.
- d) The right and obligation not to disclose certain records for purposes other than accident and incident investigation, unless the Supreme Court determines that their disclosure outweighs the adverse domestic and international impact such action may have on that or any future investigation. Such records include:
 - 1) all statements taken from persons by the Investigators during the course of the investigation;
 - 2) all communications between persons having been involved in the operation of the aircraft; medical or private information of persons involved in the accident or incident;



- 3) cockpit voice recordings and transcripts from such recordings;
- 4) recordings and transcriptions of recordings of air traffic control units;
- 5) cockpit airborne image recordings and any part or transcripts from such recordings;
- 6) opinions expressed in the analysis of information, including flight recorder information; and any record not relevant for analysis of the accident or incident.

6.4 INVESTIGATION OPERATIONS

The Bureau's Investigators have the following rights, authority, and obligations to:

- a) Call on the services of local police or other authorized persons to ensure protection of the aircraft accident site, including the aircraft and its contents, and to directly take over custody and security of the aircraft and its contents, until such time as the Bureau awaits the arrival of the Investigators from the delegated state.
- b) Ensure that the aircraft, its contents, and other relevant evidence remain undisturbed, to the extent possible, until arrival and inspection by an Accredited Representative, if requested to do so.

Note.— Nothing in this provision precludes the Bureau from instituting an investigation, and if for unforeseen reasons, the aircraft, etc. must be moved or otherwise disturbed pending the arrival of an Accredited Representative, the activities involved should be documented by photographs and other appropriate means.

- c) Ensure, in the event of an occurrence to be investigated, that all Air Traffic Services (ATS) communications recordings, radar data, and documents associated with the flight are secured for safekeeping.
- d) Permit Accredited Representatives of the following States to participate in any investigation:
 - 1) The State of Registry;
 - 2) The State of the Operator;
 - 3) The State of Design;
 - 4) The State of Manufacture; and
 - 5) Any other State that on request provides information, facilities or experts.
- e) Permit advisers assisting Accredited Representatives to participate in an investigation to the extent necessary in order to make the participation by the Accredited Representatives effective.
- f) Permit participation of experts (within the provisions of Sierra Leone Civil Aviation Regulations (SLCAR) Part 13, paragraph 5.27) from States having suffered fatalities or serious injuries to their citizens. Such experts should be permitted to:



- 1) Visit the scene of the accident;
- 2) Have access to the relevant factual information, which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
- 3) Receive a copy of the Final Report.

Note.— Experts appointed under the provisions of ICAO Annex 13, paragraph 5.27, are not necessarily permitted to participate in the actual investigation; rather, they are provided limited access (cited above) related to the circumstances pertaining to the death or injury of citizens from their State(s). Likewise, experts should be permitted to assist in the identification of victims and in meetings with survivors from their respective States.

- g) Entitle Accredited Representatives under the control of the IIC to participate in all aspects of the investigation, in particular to:
 - 1) Visit the scene of the accident;
 - 2) Examine the wreckage;
 - 3) Obtain witness information and suggest areas of questioning;
 - 4) Have full access to all relevant evidence as soon as possible;
 - 5) Receive copies of all pertinent documents;
 - 6) Participate in read-outs of recorded media;
 - 7) Participate in off-scene investigative activities, such as component examinations, technical briefings, tests and simulations;
 - 8) Participate in investigation progress meetings including deliberations related to analysis, findings, causes and safety recommendations;
 - 9) Make submissions in respect of the various elements of the investigation; and
 - 10) Advisers assisting the ACCREP shall be permitted under the ACCREP's supervision, to participate in the investigation to the extent necessary to enable the ACCREP to make their participation effective.
- h) Invite participation of the operator in the investigation, when neither the State of Registry nor State of the Operator appoints an Accredited Representative.
- i) Invite participation of the manufacturer(s) (type design and/or final assembly of the aircraft) in the investigation, when neither the State of Design nor the State of Manufacturer appoints an Accredited Representative.



- j) Call on the best technical expertise available from any source to supplement its personnel and investigative delegated staff, should the need arise.
- k) Protect evidence and maintain custody of the aircraft and its contents for a period of time necessary to conduct the investigation, including protection from further damage, access by unauthorized persons, pilfering or deterioration.
- l) Photograph and document evidence of a transitory nature by appropriate means to preclude loss of evidence.
- m) Coordinate between the Bureau and judicial authorities to ensure that the sole purpose of the investigation is for accident prevention purposes, and to ensure that any judicial or administrative proceedings to apportion blame or liability are separate from the ICAO Annex 13 investigation.
- n) Ensure that arrangements are in place for autopsy examinations, as well as toxicological tests, are carried out for crew members and passengers for medical investigation purposes. Medical examinations also should be carried out on surviving flight crew, passengers and aviation personnel involved in the occurrence, such as air traffic controllers, if deemed necessary by the IIC.
- p) For investigations being conducted by other States, provide the State conducting the investigation with:
 - 1. (in all cases) all relevant information requested by that State; and
 - 2. (in all cases) information about an aircraft that prior to the occurrence of an accident or incident has used or normally would use the facilities or services of Sierra Leone. For example, flight crew and aircraft maintenance records, ATS recordings, meteorological information, etc., related to the occurrence should be provided to the State conducting the investigation.
- q) Appoint an Accredited Representative from the Bureau in the case of an accident involving an aircraft of a maximum mass of over 2 250 kg, when specifically requested to do so by the State conducting the investigation.

Note.— Such an appointment does not necessarily require that the Bureau's Accredited Representative travel to the accident site; however, the Accredited Representative is required to fulfill the obligations contained in ICAO Annex 13 by providing whatever assistance is required.

- r) Prevent disclosure of information by the Accredited Representative appointed by the Bureau and by Sierra Leone advisers on the progress and findings of an investigation, without the express consent of the State conducting the investigation.

Note 1 — Because the responsibility for release of information on the progress and findings of the investigation rests with the State conducting the investigation, the Bureau will ensure that its personnel and any advisers from Sierra Leone abide by this requirement.



Note 2 — Nothing in this requirement precludes, or should delay, the release of information for the purpose of accident prevention (issuance of safety recommendations); however, such release should be coordinated with the State conducting the investigation.

- s) For accidents involving death or serious injury to Sierra Leone citizens that occur in other States, Sierra Leone will appoint an expert, possibly from the Bureau, in accordance with the provisions of Sierra Leone Civil Aviation Regulations (SLCAR), Part 13 paragraph 5.19.7, to:
 - 1) visit the scene of the accident;
 - 2) have access to the relevant factual information, which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
 - 3) receive a copy of the Final Report.
- t) Reopen an investigation if new and significant evidence becomes available, or if significant errors were made in the original analyses that would compromise the findings.
- u) Make public the facts, conditions, and circumstances during the course of an investigation with the view toward informing the travelling public and preventing future occurrences.
- v) Identify safety deficiencies during the course of investigations and in the Final Report of the investigation with the view toward promoting safety actions by addressing the recommendations to appropriate authorities, agencies, and organizations charged with aviation safety.

6.5 COORDINATION AND COOPERATION WITH THE JUDICIAL AUTHORITIES

- 6.5.1 Section 79 of the Civil Aviation Act defines the rights and responsibilities of the Bureau to have immediate and unrestricted access to all relevant evidence without being impeded by judicial authorities or other government agencies. The Bureau is aware that aircraft accidents or serious incidents may be subject not only to a technical investigation but also to some form of judicial, regulatory, labor, occupational health and safety, environmental protection, administrative and/or disciplinary inquiries.
- 6.5.2 In order to ensure that the accident investigation procedures are not constrained by these types of processes, Civil Aviation Act and the Sierra Leone Civil Aviation Regulations, Part 13 - Aircraft Accidents and Incidents Investigation and perhaps MOUs specify the procedures to be followed in order to keep the technical investigation separate from these other proceedings. The legislation (Act and the regulations) makes it clear that accident prevention is the sole objective of the technical investigation and emphasize that it is not the role of the Bureau to apportion blame or liability.
- 6.5.3 The Civil Aviation Act provides that the Bureau shall have investigative priority over the investigation of aircraft accidents and serious incidents investigation involving civil aircraft. The provision states that where in the course of an investigation, the Bureau determines that circumstances reasonably indicate that the occurrence may have been caused by an intentional criminal act, the Bureau and the other government agencies involved in the investigation shall take all reasonable measures to ensure that activities with respect to the transportation occurrence are coordinated to achieve the aims of the safety investigation.



- 6.5.4 Where conflicting interests arise between the Bureau and an agency of government as to coordination of activities related to an aircraft accidents or serious incidents, the requirements and interests of the Bureau and any agreement entered into pursuant to regulations made under the Civil Aviation Act, shall take precedence to the extent of the conflict.
- 6.5.5 The Civil Aviation Act and the regulations also provide that the following records shall not be made available for purposes other than accident or incident investigation, unless the Courts, being the competent authority determines that their disclosure or use outweighs the likely adverse domestic and international impact such action may have on that or any future investigations:
- a) cockpit voice recordings and airborne image recordings and any transcripts from such recordings; and
 - b) records in the custody or control of the accident investigation authority being:
 - i) All statements taken from persons by the accident investigation authority in the course of their investigation;
 - iii) All communications between persons having been involved in the operation of the aircraft;
 - iv) Medical or private information regarding persons involved in the accident or incident;
 - v) Recordings and transcripts of recordings from air traffic control units;
 - vi) Analysis of and opinions about information, including flight recorder information, made by the
 - vii) Accident investigation authority and accredited representatives in relation to the accident or
 - viii) Incident; and
 - x) The draft Final Report of an accident or incident investigation.
- 6.5.6 The Investigator-in-charge shall ensure that these records are only included in the Final Report or its appendices when pertinent to the analysis of the accident or incident, and those parts of the records not relevant to the analysis shall not be disclosed. This is essential since information contained in these records, which includes information given voluntarily by persons interviewed during the investigation, could be utilized inappropriately for subsequent disciplinary, civil, administrative and criminal proceedings. If such were the case, people would, in future, be reluctant to openly disclose information to investigators, which would impede the investigation process and seriously affect flight safety.
- 6.5.7 To give effect to the provisions of the Civil Aviation Act and the Sierra Leone Civil Aviation Regulations, the Commissioner should make prior arrangements with the judicial authorities and any other government agency that might have interest in the activities related to the transportation occurrence for coordination and cooperation to guarantee the separation of the technical investigation from any other investigation.
- 6.5.8 The prior arrangement should be in the form of a memoranda of understanding (MoUs) between the Bureau and the identified agencies. The Commissioner of the Bureau is responsible for the identification of authorities and agencies concerned and the drafting of the preliminary texts of the MoUs.
- 6.5.9 The Commissioner shall also be responsible for the coordination meetings between the Bureau and identified authorities and agencies that subject of the MoUs.



- 6.5.10 The MoUs shall be based on the principles and guidelines contained in appendices to chapter 2 of ICAO Doc 9756 Part I Manual of Aircraft Accidents and Incidents Investigation - Organization and Planning.
- 6.5.11 In particular, the MoU with judicial authorities shall specify the coordination and cooperation mechanism to ensure separation of the technical investigation from any parallel investigation to be conducted by the judicial authorities that to ensure neither judicial processes, administrative proceedings nor disciplinary processes hinder timely retrieval, read-out and analysis of the flight recorders. The modalities for the custody and transportation of the recorders from the accident site to the facility where read-out and analysis is to be conducted shall be established in the MoU.
- 6.5.12 In addition, the MoU shall contain mechanisms for balancing test to ensure the records identified in this section are not disclosed to the public or used for purposes other than accident or incident investigation, including the conditions under which such documents or information can be disclosed such as in camera or closed proceedings limited to the parties involved.



CHAPTER 7 - ACTIONS AT THE ACCIDENT SITE

7.1 GENERAL

7.1.1 Liaison with other authorities

- 7.1.1.1 The Bureau has agreements in the form of MoUs with other agencies and authorities in Sierra Leone to prepare for the eventuality of an aircraft accident (see Appendix C). Detailed information concerning the role and responsibility of each agency, for each type of emergency, is contained in the ICAO Airport Services Manual (Doc 9137), Part 7 Airport Emergency Planning. Although that manual deals primarily with accidents at or near an airport, the role and responsibility of each agency outlined therein may also apply to accidents elsewhere.
- 7.1.1.2 Victim identification is the responsibility of the medical officials, the Sierra Leone Police and the victim identification team. Medical personnel, such as pathologists and forensic dentists, should be aware of what is expected of them in the event of an aircraft accident, including autopsies and toxicology examinations. The Bureau will coordinate its needs in advance with the medical specialists in order to facilitate these arrangements.
- 7.1.1.3 Notification of next of kin is a sensitive task that must be planned and undertaken with great care in order to avoid anomalies, such as multiple or erroneous notifications. In Sierra Leone, the notification of next of kin is a police, airline or medical examiner task. The ICAO Policy on Assistance to Aircraft Accident Victims and their Families (Doc 9nd the Manual on Assistance to Aircraft Accident Victims and their Families (Doc 9973) and ICAO Circular 285 Guidance on Assistance to Aircraft Accident Victims and their Families provides further guidance in this regard.
- 7.1.1.4 Although it is recognized that the circumstances surrounding each accident are different, the importance of proper planning and establishing good liaison with other authorities, particularly the police, the Operator's Aerodrome fire department/the local fire department and the search and rescue services, cannot be overemphasized.
- 7.1.1.5 The Bureau will rely on assistance from other civil and military organizations to provide facilities, equipment and additional personnel, i.e. means of transportation, heavy lifting and moving gear, metal detectors, communication equipment, and divers. It is important that heavy salvage equipment, such as cranes, bulldozers, or other heavy-duty machines are readily available. In some cases, a full-scale expedition may have to be organized, requiring additional transportation, food, lodging, etc.

7.1.2 Initial actions at the accident site

- 7.1.2.1 The local fire department and the police will probably be the first authorities to arrive at an aircraft accident site. It is therefore important to enlist the cooperation of these authorities in order to ensure security and control of accident sites and cooperation during investigations. It is essential that vital evidence is not lost through interference with the aircraft wreckage in the early phases of an investigation. The local fire department and the police should be aware of what is expected of them in the event of an aircraft accident. The Bureau is responsible for coordinating its needs in advance with relevant search and rescue organizations. Plans and arrangements for the following essential tasks are in place so that they can be accomplished without delay:



- a) notification to the rescue coordination center (ICAO Annex 12 - Search and Rescue refers);
- b) notification to the Bureau and other authorities, as necessary;
- c) securing the aircraft wreckage from fire hazards and further damage;
- d) checking for the presence of dangerous goods, such as radioactive consignments or poisons being carried as freight, and taking appropriate protective action;
- e) placing guards to ensure that the aircraft wreckage is not tampered with or disturbed;
- f) taking steps to preserve, through photography or other appropriate means, any evidence of a transitory nature, such as soot deposits; and
- g) obtaining the names and addresses of all witnesses whose testimony may assist in the investigation of the accident.

7.1.2.2 Apart from these arrangements, the wreckage should be left undisturbed, to the extent possible, until the arrival of the investigation team. It has been emphasized to the police and the rescue services that the bodies of persons killed in an accident involving a large aircraft should, where practicable, be left in situ for examination and recording by the police victim identification team. There may also be times when, for crashworthiness/survival investigation purposes, it may be appropriate for the deceased to be left in situ until viewed and documented by the Bureau's investigation team. Similarly, personal belongings should remain untouched as their location may assist in the identification of the victims. In general, disturbance of the wreckage should be limited to that necessary to rescue survivors, extinguish fires and protect the public.

7.2 RESCUE OPERATIONS

- 7.2.1 The primary concern of the first persons to arrive at the site of an aircraft accident is to rescue and aid survivors and protect property within the means available. Persons who are involved with the extrication of victims from aircraft wreckage should, at the earliest opportunity, record their observations regarding the location in the aircraft where the survivors were found and what portions of the wreckage had to be moved during the rescue.
- 7.2.2 If circumstances permit, the bodies of persons killed in the accident should be left as found until their location and condition are recorded, photographs are taken and a chart is made indicating their location in the wreckage. If bodies are located outside the wreckage, their location should be marked by a stake with an identifying number. A corresponding label should be attached to each body stating where it was found. The careful recording of these data is essential to the identification of bodies and also provides information which may assist in the accident investigation.
- 7.2.3 In the event that bodies have been removed from the aircraft wreckage before the arrival of the Bureau's Go team, it is important to establish whether or not a record, as set out above, has been maintained. If not, the rescue personnel should be interviewed in order to establish such a record.
- 7.2.4 The Bureau's Go team should determine if there has been any disturbance of the wreckage during the rescue operations and should record any such disturbance.



7.2.5 Upon completion of the initial rescue operation, rescue personnel should exercise as much care as possible to ensure that their movements do not destroy evidence which may be of value to the investigation. For example, once the survivors have been rescued and the fire risk has been eliminated as far as practicable, movement of ambulances and fire vehicles should not be permitted along the wreckage trail.

7.3 PROTECTION OF EVIDENCE, CUSTODY AND REMOVAL OF WRECKAGE

7.3.1 Security at the accident site

7.3.1.1 When notified of an accident, the Commissioner or the designated personnel should immediately verify that arrangements have been made to ensure the security of the wreckage. This is usually arranged through the police, but in some cases, military personnel or specially recruited civilians may be employed.

7.3.1.2 Before investigation commences at the accident site, the cargo manifest must be checked to ensure there are no hazardous materials in the consigned cargo.

7.3.1.3 When it is suspected that the aircraft may have carried dangerous cargo such as radioactive consignments, explosives, ammunition, corrosive liquids, liquid or solid poisons or bacterial cultures, special precautions should be taken to station the guards at a safe distance from the wreckage. This is particularly important if a fire has occurred because it tends to disperse the contaminants. Signs indicating a potentially dangerous area should be posted until experts, in consultation with the Commissioner or the designated personnel have thoroughly evaluated the danger involved.

7.3.1.4 Upon arrival at the accident site, one of the first tasks of the IIC or the designated personnel is to review the security arrangements. The guards should be thoroughly conversant with their duties, which are to:

- a) protect the public from the hazards in the wreckage;
- b) prevent disturbance of the wreckage (including bodies and contents of the aircraft);
- c) protect property; and
- d) admit to the accident site only persons authorized by the Bureau; and
- e) protect and preserve, where possible, any ground marks made by the aircraft.

7.3.1.5 Clear and specific instructions should be given by the IIC or the designated personnel to those guarding the wreckage site of the need for authorized persons to have proper identification. In the case of major investigations, this should be accomplished through the issuance of photographic identification badges or some form of security pass to all authorized persons. The use of armbands or jackets that show affiliation and duty may be acceptable.

7.3.1.6 If the wreckage has not been scattered, effective security can be achieved by cordon the area. However, if there is a long wreckage trail, the task of securing the site may be formidable and many guards should be required in a wide perimeter.



- 7.3.1.7 The police can be of considerable assistance in liaising with the local population, particularly with regard to locating outlying pieces of wreckage. While persons living in the neighbourhood should be encouraged to report the discovery of pieces of aircraft wreckage, the importance of leaving these pieces undisturbed should also be impressed upon them. Collecting outlying pieces of aircraft wreckage and arranging them into neat piles alongside the main wreckage are sometimes done with good, but misguided, intentions. With no record of where such pieces were found, their value to the investigation is diminished. Similarly, the removal of pieces of aircraft wreckage by souvenir hunters must be prevented.
- 7.3.1.8 The aircraft wreckage should be guarded until the IIC is satisfied that all evidence at the site has been gathered. The IIC should review the situation periodically and arrange for the progressive release of guards as appropriate.

Note - With regard to section 4.6 and 4.7 of this manual, consideration should be made at all times by the IIC for the protection of Investigators at the accident site (reference to ICAO Circular 315 Hazards at Aircraft Accident Sites)

7.3.2 Removal of wreckage and personal effects

Notwithstanding the requirement to preserve evidence, the Commissioner or IIC may permit the removal of or interference with the wreckage as may be necessary for the following purposes:

- a) extricating persons or animals;
- b) removing any mail, valuables or dangerous goods carried by the aircraft for the purpose of preservation;
- c) preventing destruction by fire or other cause;
- d) preventing any danger or obstruction to the public, air navigation or other transport; or
- e) if the wreckage is in water, the aircraft or its contents may be removed to such extent as may be necessary for bringing the wreckage or its contents to a place of safety

Note - Goods or passenger baggage or any other property removed from the wreckage shall be under the custody of police officer in-charge at the site.

7.3.3 Securing Flight Recorders, ATS Recordings and Flight Documents

- 7.3.3.1 The Investigator-in-Charge (IIC) shall ensure the immediate retrieval, preservation and safe keeping of flight recorders if installed on the aircraft, Air Traffic Services (ATS) recordings (communications, data recordings, flight plan, etc.) and other documents associated with the flight are secured and placed in safe keeping as soon as possible (refer to the Checklist Initial Actions following a Notification Appendix K).
- 7.3.3.2 Prior arrangements should also be made to immediately obtain and place in safe keeping all of the aircraft operator's documentation associated with the aircraft, the flight crew and the flight operation.



- 7.3.3.3 Arrangements should be made with the aviation meteorology authorities to obtain a special weather report as soon as they become aware of an aircraft accident.
- 7.3.3.4 Similar arrangements should be made with fuel companies to obtain fuel samples from stocks or refueling points.
- 7.3.3.5 All evidence of a transitory nature of the wreckage should be preserved through photography, video or other appropriate means.
- 7.3.3.6 The Bureau shall ensure that damaged flight recorders and recorders recovered from water are handled with the best practice against further damage. The Data frame layout shall be obtained from the operator of the aircraft being involved in the accident to enable proper readout of flight data recorder.

7.4 WRECKAGE IN THE WATER

7.4.1 Initial actions

- 7.4.1.1 As soon as it has been determined that the wreckage is in water, efforts must be made to obtain the best technical expertise available. The Bureau will call upon the services of the SLCAA based on its existing MoU, other organizations and resources with specialized expertise from outside of the country to ensure that the aircraft wreckage under water is found and recovered as necessary in a timely manner. As part of its contingency planning for an accident in the water, the Bureau has pre-arranged agreements (MoUs) with relevant organizations and States to obtain the necessary specialized assistance. (Refer to appendix C to this manual).

Note — Experience has shown that the search for and the recovery of the aircraft wreckage under water is a specialized task requiring experienced personnel and specialized equipment. Specialized agencies should be consulted early to avoid unnecessary delays in locating and recovering the flight recorders and the aircraft wreckage from under water.

- 7.4.1.2 If the water is shallow (less than 60 m (196 ft), divers can be effective for search and recovery of the wreckage; however, mapping of the wreckage using side-scanning sonar may need to be used to ensure the safety of the divers. If the wreckage is located in deep water, or conditions make it difficult to use divers, use of the following equipment may be considered:

- 1) underwater equipment used to locate the underwater locating beacons (ULB) on the flight recorders; underwater videos and cameras;
- 2) side-scan sonar equipment; and
- 3) manned or unmanned submersibles (remotely operated vehicles (ROVs)).

7.4.2 Decision to recover the aircraft wreckage

- 7.4.2.1 The circumstances and location of an accident should determine whether salvage of the aircraft wreckage is practicable and necessary. In most cases, the aircraft wreckage should be recovered, if it is considered that the evidence it might provide would justify the expense and effort of a salvage operation. If the aircraft



wreckage is likely to contain evidence significant to air safety, the Bureau will provide the impetus needed to ensure that action is promptly taken to recover the aircraft wreckage. Such action includes obtaining the necessary funding and specialized equipment and personnel for the tasks.

Note — The Bureau has established contingency plans with the government to obtain immediate supplementary funding in accordance with the Civil Aviation Act of Sierra Leone Section 75(2) in the case of a major accident, which shall also entail search and recovery operation for wreckage under water.

7.4.3 Aircraft wreckage distribution

Once the aircraft wreckage has been located, a chart plotting the wreckage distribution should be prepared. In shallow waters, divers can achieve this. In deep waters, side-scan sonar and underwater video cameras from remotely operated submersibles may be used. The state of the various pieces of aircraft wreckage, their connection by cables or tubes, the cutting of these connections for the salvage operations, etc., should be recorded before lifting the various pieces of aircraft wreckage from the bottom. Usually, the divers are not experienced in aircraft accident investigation and, therefore, detailed briefings will be necessary.

7.4.4 Preservation of the aircraft wreckage

7.4.4.1 The rates at which various metals react with salt water vary considerably. Magnesium components react quite violently and, unless recovered within the first few days, may be completely dissolved. Aluminum and most other metals are less affected by immersion in salt water. However, corrosion will rapidly accelerate once the component is removed from the water, unless steps are taken to prevent this from occurring.

7.4.4.2 Once the aircraft wreckage has been recovered, the components should be thoroughly rinsed with fresh water. It may be convenient to hose the aircraft wreckage as it is raised out of the sea prior to it being lowered onto the salvage vessel. Freshwater rinsing does not stop all corrosive action. When large aircraft are involved, it may not be practicable to take further anti-corrosion action on large structural parts. However, all components that require metallurgical examination will require further preservation. The application of a water-displacing fluid should provide additional corrosion protection; fracture surfaces should then be given a coat of corrosion preventive substances such as oil or inhibited lanolin.

7.4.4.3 When organic deposits, such as soot deposits or stains, require analysis, organic protective substances should not be used. Freshwater rinsing should be employed followed by air drying. When the component is completely dry, it should be sealed in a plastic bag with an inert desiccant such as silica gel.

CAUTION: UNDER NO CONDITIONS SHOULD AN ATTEMPT BE MADE TO REMOVE OR TO PLAY A TAPE FROM AN FDR OR CVR IN THE FIELD. THE DATA COULD BE ERASED OR DAMAGED.

7.5 PROCEDURES FOR HANDLING FLIGHT RECORDERS

7.5.1 Flight recorders must be handled in accordance with the Bureau's flight recorder policy.



- 7.5.2 Protect the recorder from strong magnetic fields. It is important to remember that an X- ray transmitter at an airport security station may damage the data. If a recorder, tape or solid-state memory unit is mailed, please mark the package

“SENSITIVE FLIGHT RECORDING WITH CRITICAL DATA. DO NOT EXPOSE TO X-RAY RADIATION OR MAGNETIC FIELDS”.

- 7.5.3 Do not open the recorder and do not allow anyone to remove the tapes or solid-state memory unit under any circumstances. If the recorder is dry and undamaged, use a shipping container obtained from the operator involved in the accident or incident, if possible. Otherwise, package it carefully for shipment, unless it is to be hand-carried; it is not necessary to package an undamaged recorder for hand-carriage.
- 7.5.4 If the case is broken, do not remove the tape or solid-state memory unit from the device. Wrap the entire recorder and its contents in polyethylene or similar material or heavy paper before packaging for shipment.
- 7.5.5 If the tape reels or solid-state memory boards are separated from the unit, wrap them in polyethylene or paper before applying sealing tape. Never apply sealing tape directly to the recording medium. Do not remove the recording medium from the reels or enclosure.
- 7.5.6 If the recording is a tape and it is found separated from the recorder, try not to wrinkle or crease it. Carefully wrap it on a spool or cardboard tube or something similar. Wrap this in polyethylene or paper and pack it carefully. Enclose all fragments of tape, no matter how small. Never pack the tape randomly into a box or container. Data are easily degraded; creases and wrinkles can cause electronic noise and permanent data loss.
- 7.5.7 If the flight recorders are found in water, they should not be dried, but should be kept immersed in fresh or distilled water until the assigned flight recorder specialist assumes responsibility for them.
- 7.5.8 Flight recorders that have been submerged in water shall not be allowed to dry out before reaching the safety laboratory, in order to prevent damage to the recording media.



CHAPTER 8 - ORGANIZATION AND MANAGEMENT OF THE INVESTIGATION

8.1 GENERAL

- 8.1.1 At the moment the Bureau does not have the capacity to conduct investigation of an aircraft accident or serious incident. However, it has identified certain accident investigation authorities, including Banjul Accord Accident Investigation Agency (BAGAIA) within the sub-region that have the expertise and equipment required for the conduct of an investigation. Hence, the Bureau has signed memoranda of understanding (MoUs) with the Nigeria Safety Investigation Bureau investigation the accident investigation Bureau for the delegation in whole or part of the conduct of investigation of aircraft accidents or serious incidents. The Bureau has also identified the need to make arrangement with the accident investigation authorities of the States of Manufacture, States of Design and the State of the Operators of the aircraft types that are operated into Sierra Leone for assistance in terms of accident investigation expertise. Information, training and equipment.
- 8.1.2 For accident, serious incident and incident investigation, the Bureau's Investigator(s) shall be allowed to participate in the conduct of the investigations as observers subject to the powers and directions of the Investigator-in-charge (IIC) to serve the purpose of their practical on-the-job-training (OJT), hence these procedures shall be adopted.
- 8.1.3 To achieve its purpose, an investigation must be properly planned and managed. The main parts of an investigation must be planned so that the members of an investigation team are aware of their various tasks and have the appropriate qualifications to perform them. The plan must also recognize that these tasks should be coordinated by the IIC, who is the leader of the team.
- 8.1.4 When a large aircraft is involved, a sizeable team of Investigators, set up in specialized groups, is necessary to properly cover all aspects of the investigation. In some investigations, the areas on which the investigation should focus will become evident at an early stage, and the main investigation effort can then be effectively channeled into these relatively specialized areas. Nevertheless, it is still essential that Investigators progress systematically through all aspects of the accident. Whether or not the causes of an accident are apparent, the investigation will determine any underlying systemic factors that may have contributed to the accident or its aftermath as well as any non-causal deficiencies that could contribute to future accidents or their aftermath.
- 8.1.5 In the case of accidents involving small aircraft, the investigation effort is proportionately smaller. The functions are still the same, but the work is undertaken by one or two Investigators or, alternatively, by an Investigator and a specialist qualified in a particular aspect that requires expert examination. Again, it is stressed that even when small aircraft are involved, pre-investigation planning and use of investigation checklists are essential.

8.2 THE INVESTIGATION MANAGEMENT SYSTEM

8.2.1 Smaller investigations of incident and accidents



8.2.1.1 The investigation of incidents and non-major accidents may be conducted by one Investigator, sometimes assisted by one or few other investigators. In such situations, the Heads of Technical and Operations units will have the responsibility for the organization, conduct and reporting of the investigation, and will also be active in the investigation work appropriate to each other's expertise and background. For example, if the IIC has a pilot background, then another team member could have different technical expertise and background. Depending on the circumstances of the occurrence, other subject matter experts (such as air traffic control, aircraft performance, flight recorders, and human factors) could be assigned to the investigation team. Figures 8-1, 8-2 and 8-3 contain sample organizational charts for smaller investigation teams.

8.2.1.2 Smaller investigations will vary from occurrence to occurrence. It could be a field investigation for which some of the investigators would deploy to the occurrence site, the location of the aircraft, the airline's office, and/or the air traffic facility; or it could be an office where all or most of the investigation is concluded from the Bureau's offices.

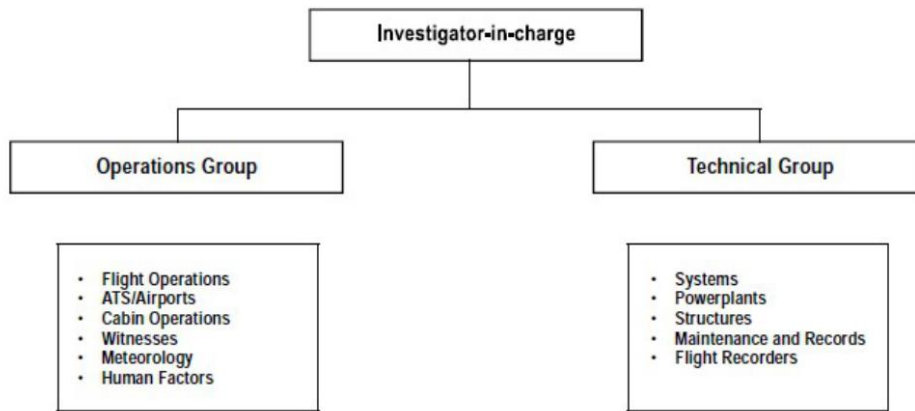


Figure 8-1: Sample Organizational Chart for Smaller Investigation (Option 1)

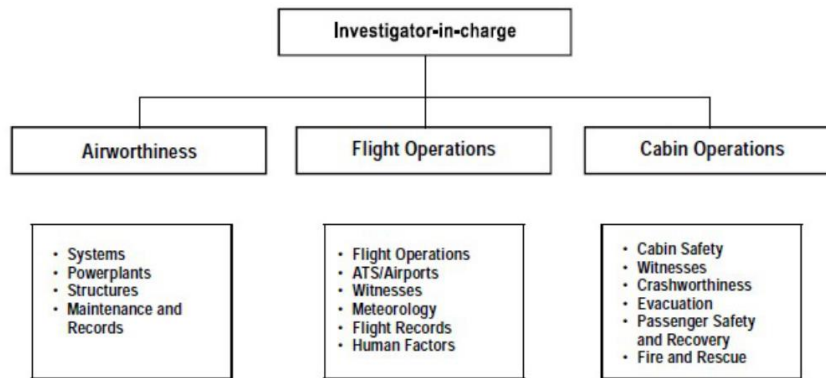


Figure 8-2: Sample Organizational Chart for Smaller Investigation (Option 2)

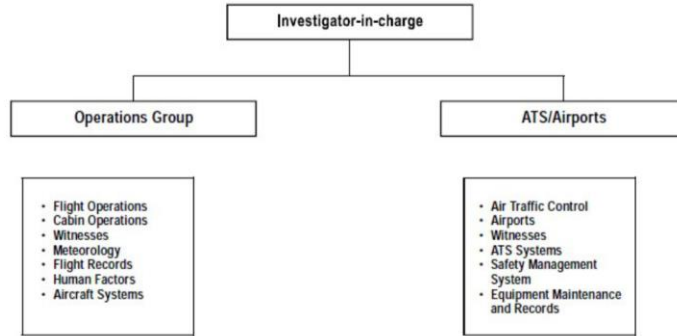


Figure 8-3: Sample Organizational Chart for Smaller Investigation (Option 1)

8.2.1.3 Where a non-major accident occurs on an airfield, there will likely be significant pressure to remove the wreckage so that normal operations can resume. In the same vein, for incidents that occur in flight or on the airport maneuvering area, there might be significant pressure to move the aircraft and to return it to normal operations. In both these situations, the primary concern for the investigation should be the potential for loss of evidence. In this regard, the IIC may have to put a priority on properly documenting the wreckage site and/or the aircraft prior to its removal.

8.2.1.4 For incidents wherein there has been little or no damage, there will likely be sufficient pressure to return the aircraft to normal operations. Removing a recorder may delay the dispatch of an otherwise serviceable aircraft. In this regard, the investigator may have to put a priority on:

- (a) first, ensuring that flight recordings are protected properly;
- (b) second, determining if the recordings are required for the investigations;
- (c) third, downloading the recordings; and
- (d) forth, releasing the aircraft for operations.

8.2.1.5 For incidents and non-major accidents, it may be difficult to get on-site support from all entities having an interest in the investigation, such as foreign States, airlines and aircraft and component manufacturers. As a result, extra effort will have to be taken to ensure good communications between the authority’s team and these other entities throughout the investigation.

8.2.2 Responding to notifications of smaller accidents or incidents

8.2.2.1 Although immediate notification of accidents and incidents to the Bureau is essential, the uncertainty regarding the circumstances of incidents and non-major accidents, and perception that such occurrences may be low-risk events, frequently lead to delayed and incomplete notifications. Such time delays usually lead to the loss of perishable evidence. Upon receipt of notifications, the duty Officer should immediately contact the report source to ensure that all required information has been provided, to determine who and



what organizations may have been involved in the occurrence, to determine who else has been informed of the occurrence, and to determine what actions have already been taken in response to the occurrence.

8.2.3 Securing Documentation in smaller investigation

8.2.3.1 From the early stage in the investigation, it is important to secure the operational and maintenance documents of the occurrence aircraft, as well as all other documents relevant to the occurrence. What documents will be required for the investigation also depends on the nature of the occurrence. The IIC should decide as soon as possible, what documents need to be obtained and from which organizations (see Investigation Events Checklist – Appendix M). He should by telephone, email or any suitable means, contact relevant organizations (airline, maintenance facility, Robert Flight Information Region (RFIR), SLCAA, SLAA, SLMET, etc.) to secure the documents necessary for the investigation.

8.2.4 Major accident investigation

8.2.4.1 An accident investigation involving a large or complex aircraft should require a large team of Investigators in order to conduct the investigation in the most effective and expeditious way. The effective utilization of the available Investigators in a major investigation can be achieved by using an “investigation management system” (reference to ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part II, Chapter 4). The investigation management system divides the investigation activities into functional areas, each of which can be assigned to a group within the investigation team. Each investigation group should have as many members as are necessary to examine the particular circumstances of the accident.

8.2.4.2 After the initial visit and walk-through of the accident site, the first management action to be taken by the IIC is to convene an “organizational meeting”. At the organizational meeting, the IIC should identify all participants who should be assigned to the team and he/she should excuse others, such as news media, lawyers, insurers, who should not be permitted to be part of the team.

8.2.4.3 The primary purpose of the organizational meeting is to describe the rules, policies and procedures of the investigation and to organize the team into the specific groups responsible for various aspects of the investigation.

Note 1.— Attention must be paid to the need to facilitate entry of Accredited Representatives and advisers from other States involved in the investigation. To this end, the State of Occurrence of the accident must not require any other travel document than a passport of qualified personnel designated or appointed by other States to participate in the investigation. In this connection, reference is to be made to ICAO Annex 9 Facilitation, Chapter 8 Section B.

Note 2.— Organizational meetings should be convened by the IIC for both large and small investigations as part of the investigation management system.

Note 3.— If properly planned and organized, the organizational meeting should take less than one hour so that the investigation groups can then begin their important work.

8.2.4.4 At the organizational meeting, the IIC should discuss the rights, obligations, and responsibilities of the Investigators. The IIC should also discuss the policies and procedures contained in this manual and should



make available a copy of this manual for review by all participants to ensure they understand their roles, tasks and duties. Then the IIC should organize the investigators into groups led by senior investigators.

- 8.2.4.5 An attendance sheet should be circulated for all participants to sign. Signing the attendance roster confirms that the person signing has read, understood, and will comply with the legislation, regulations, policies and procedures during the course of the investigation. Administrative personnel should be assigned to ensure all participants sign the attendance roster for each team meeting.

Note.— Use of interpreters is important during team meetings, even though all participants appear to fully understand English during the meetings. Those persons, for whom English is not their first language, may have difficulty with complex issues.

- 8.2.4.6 Depending on the magnitude and circumstances of the accident, several groups may be formed for various technical investigation areas (see Figures 8-4, 8-5 and 8-6).

- 8.2.4.7 The investigation group chairpersons are senior Investigators, each responsible for a specific group. The members of the investigation groups should include specialists from the Bureau, the airline, the SLCAA, the aircraft and engine manufacturers, the airport, and employee unions, as appropriate. The groups also may include advisers assigned by the Accredited Representatives from other States. All members of the group should normally have access to all information uncovered in the course of the investigation and are required to participate in the investigation until the group report is completed.

- 8.2.4.8 The investigation groups that might be formed during a major investigation might include:

- (a) Witnesses;
- (b) Meteorology/Weather;
- (c) Air Traffic Services;
- (d) Aircraft Structures;
- (e) Aircraft Systems;
- (f) Powerplants;
- (g) Maintenance Records;
- (h) Survival Factors;
- (i) Human Performance;
- (j) Aircraft Performance; and
- (k) Flight Recorders.



Other special groups may be formed as the need arises, such as Fire and Explosion, Underwater Recovery, Mock-up, etc. The circumstances and complexity of the accident should determine the number and types of groups required.

Note 1.— The ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756) Part I, Chapter 3 Investigation Responsibilities, provides an overview of the typical responsibilities of investigation team members of a major investigation. In addition, Chapter 4 Major Accident Investigations, includes information on the Major Accident Investigation Guide (MAIG), which provides the IIC, group chairpersons and other investigation team members with basic major investigation guidelines.

Note 2.— The ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part III, contain detailed guidance on how to conduct specific areas of investigation.

Note 3.— Each of the group chairpersons should provide a copy of the relevant guidance materials to his/her group members to review before beginning the investigation.

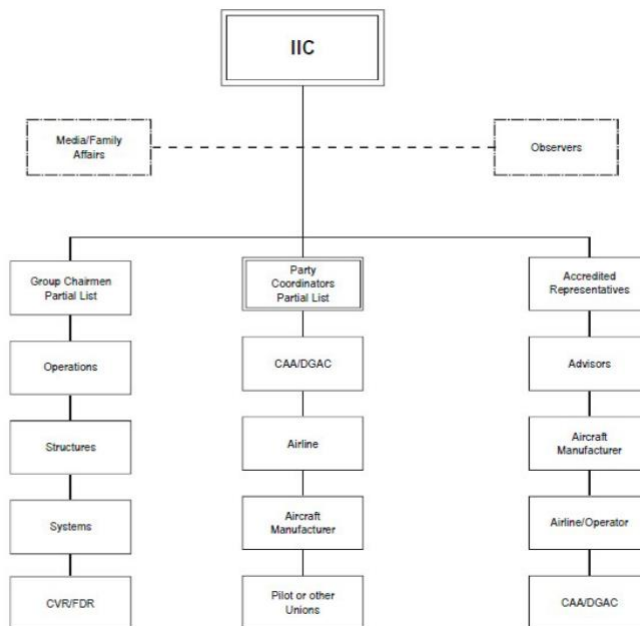


Figure 8-4: Example of a Major Investigation Team Organization

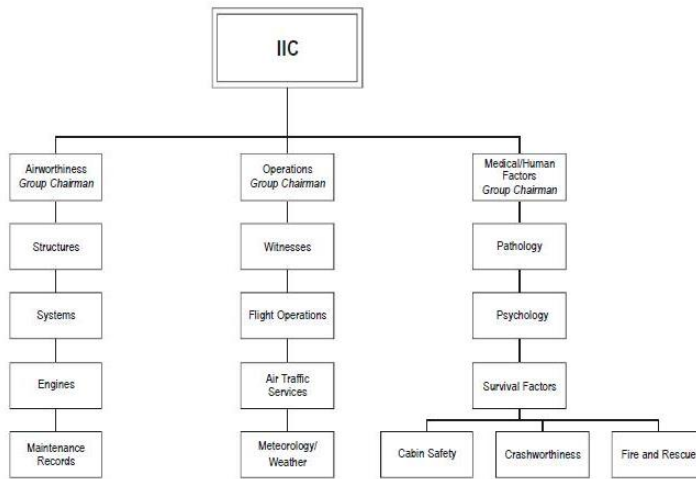


Figure 8-5: Major Investigation Team – Example A

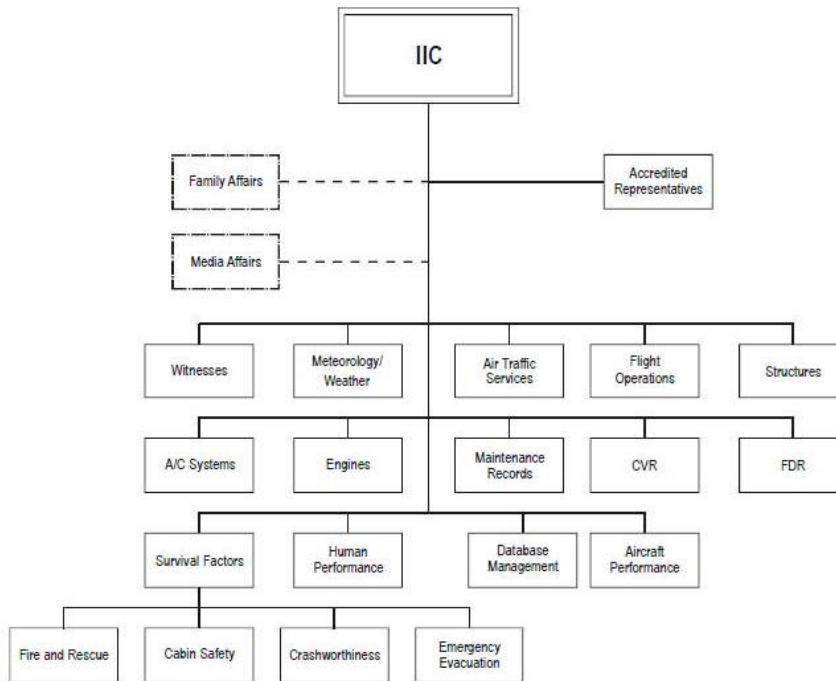


Figure 8-6: Major Investigation Team – Example B

8.2.4.9 In all investigations, a coordinator (spokesperson/team leader) from each of the organizations involved (airline, regulator, manufacturer, etc.) is appointed for liaison duties with the IIC, and to oversee the work of the specialists from their organization. The IIC is the person responsible for communications with the Accredited Representatives (and their advisers) from other States participating in the investigation in accordance with ICAO Annex 13.



8.2.4.10 Accident investigation management can be greatly facilitated if the IIC uses a flow chart (Figure 8-7) with a number of events (refer to Figure 8-8). Each event has a corresponding descriptive phrase. The flow chart allows the Investigators to ensure that the essential sequence of events is followed. Appendix M to this manual contains an “Investigation Event Checklist (Appendix M) and Investigation Event Task-Assignment Chart (Appendix M)” specifically intended to aid accident investigation management by documenting the various stages of the investigation. This Event checklist should be used as a tool to manage the various investigation steps to be taken to complete the investigation. It is a tool only and can be supplemented by other materials.

INVESTIGATION MANAGEMENT SYSTEM — EVENT FLOW CHART

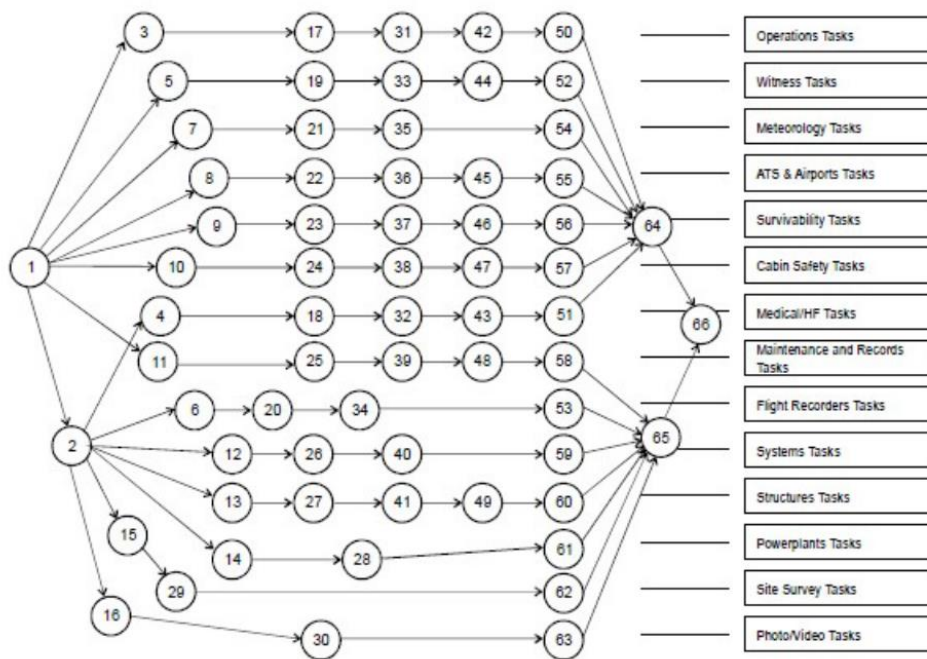


Figure 8-0-7: Investigation Management System Events Flow Chart



INVESTIGATION MANAGEMENT SYSTEM EVENTS

1. Initial response
2. Initial actions at the site
3. Secure flight operations documents
4. Human remains recovery
5. Eyewitness interviews
6. Flight recorder recovery
7. Secure weather documents
8. Secure air traffic services and airport documents
9. Search and rescue operations
10. Secure pertinent cabin documents
11. Secure maintenance documents
12. Examination of systems
13. Examination of structures
14. Examination of engine(s) and propeller(s)
15. Initial survey of the accident site
16. Site photography (Phase 1)
17. Review of operations documents
18. Crew member medical examinations
19. Plot flight path
20. Read-out of flight recorders
21. Review of weather documents
22. Review air traffic services and airport documents
23. Evacuation operations
24. Review pertinent cabin documents
25. Review of maintenance documents
26. Examination and testing (Systems)
27. Fire and explosion
28. Examination and testing (Powerplants)
29. Wreckage distribution plotting
30. Site photography (Phase 2)
31. Flight crew members interviews
32. Victim identification
33. Interviews of next of kin
34. Analysis of flight recorders data
35. Interviews (Meteorology)
36. Interviews (Air Traffic Services and Airport)
37. Rescue operations
38. Cabin condition
39. Interviews (Maintenance and Records)
40. Interviews (Systems)
41. Crashworthiness
42. Aircraft performance
43. Autopsies
44. Re-interviews (Eyewitnesses)
45. Navigation aids and airport status
46. Firefighting operations
47. Interviews (Cabin crew and passengers)
48. Maintenance management
49. Wreckage reconstruction
50. Analysis and report of Operations Group
51. Analysis and report of Medical/Human Factors Group
52. Analysis and report of Witness Group
53. Analysis and report of Flight Recorders Group
54. Analysis and report of Meteorology Group
55. Analysis and report of ATS and Airport Group
56. Analysis and report of Survivability Group
57. Analysis and report of Cabin Safety Group
58. Analysis and report of Maintenance and Records Group
59. Analysis and report of Systems Group
60. Analysis and report of Structures Group
61. Analysis and report of Powerplants Group
62. Analysis and report of Site Survey Group
63. Analysis and report of Photo/Video Group
64. Operations analysis and findings
65. Technical analysis and findings
66. Report of the Investigator-in-charge

Figure 8-0-8: Investigation Management System Events



INVESTIGATION EVENT TASK-ASSIGNMENT CHART

Investigation Group	Assigned Events							
Administration Support								
Head Office Coordinator								
Media Coordinator								
Site Safety								
Investigator-in-charge								
Deputy Investigator-in-charge								
Operations								
Aircraft Performance								
Human Factors								
Medical and Pathology								
Witness								
Flight Recorders								
Meteorology								
Air Traffic Services								
Airports								
Survivability								
Cabin Safety								
Maintenance and Aircraft Records								
Systems								
Structures								
Crashworthiness								
Powerplants								
Site Survey								
Photo/Video								

Figure 8-0-9: Example of a blank Investigation Management System Task-Assignment Chart

Investigation Event Task-Assignment Chart								
Investigation Group	Assignment Events							
Administrative Support								
Head Office Coordinator								
Media Coordinator								
Site Safety Coordinator								
Investigator-in-charge								
Deputy Investigator-in-charge								
Operations								
Aircraft Performance								
Human Factors								



Medical and Pathology									
Witness									
Flight Recorders									
Meteorology									
Air Traffic Services									
Airports									
Survivability									
Cabin Safety									
Maintenance and Aircraft Records									
Systems									
Structures									
Crashworthiness									
Powerplants									
Site survey									
Photo/Video									

Figure 8-0-10: Example of a filled Major Investigation management System Event Task-Assignment (Appendix M)

8.2.4.11 Each event checklist should be used in conjunction with the Major Accident Investigation Guide contained in the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part II; and the specific investigation task materials (checklists) contained in Doc 9756, Part III, and tailored to the particular accident circumstances. Since the investigation tasks may differ due to the circumstances of the accident, the checklists should be reviewed to ensure that the tasks are appropriate to the organization and conduct of the accident investigation. Arranging the activities and tasks into checklists allows the IIC to clearly indicate what has been accomplished and what is to be accomplished by the Investigators and the various groups during the investigation. It also makes it easier for the IIC to provide direction and guidance to those persons who are participating in an investigation for the first time and who may require specific advice. The checklists, aside from being part of the investigation management system, establish some order in what is often a confusing situation.

8.2.4.12 The group chairpersons are responsible for completing the investigation tasks using their relevant checklists in order to fulfill their various tasks. Therefore, the group chairpersons must be knowledgeable about the investigation management system and the tasks their groups are required to carry out. They should be well aware that the outlined tasks are not necessarily exhaustive and that particular circumstances may warrant revision of tasks. When using the checklists, it is desirable that the Investigators take note of the completion date of each task, any further action required or anything of significance associated with a particular task. Regardless of how much planning goes into the preparation of the checklists, there will inevitably be cases in which the outlined tasks will have to be adapted to the particular circumstances of the investigation.

8.2.4.13 The checklists help the group chairpersons organize the work of their groups, and provide the IIC with a tool to monitor progress. At the daily progress meetings, the Investigators should report which tasks on their checklists have been completed since their last report, and the IIC should record that progress on the flow chart. The advantage of this system is the ease with which the progress of the investigation can be reported to headquarters from the accident site and the fact that the flow chart at headquarters can be updated to reflect the current status of the investigation.



8.2.4.14 The investigation management system is one of the fundamental tools to be used in a major investigation, and an Investigator who is likely to be appointed IIC or group chairperson of a major investigation should be familiar with this system prior to attempting to use it in the field. The effectiveness of the system is directly related to how well each Investigator adheres to the flow chart and the checklists.

8.2.4.15 It is the policy of the Bureau to use the investigation management system during the conduct of its investigations.

8.2.5 Investigating Operational Human Factors and Organizational Aspects

8.2.5.1 General

8.2.5.1.1 From the early 1900s until the late 1960s, aviation emerged as a form of mass transportation in which identified safety deficiencies were initially related to technical factors and technological failures. The focus of safety endeavours was therefore placed on the investigation and improvement of technical factors (the aircraft, for example). By the 1950s, technological improvements led to a gradual decline in the frequency of accidents, and safety processes were broadened to encompass regulatory compliance and oversight.

8.2.5.1.2 By the early 1970s, the frequency of aviation accidents had significantly declined due to major technological advances and enhancements to safety regulations. Aviation became a safer mode of transportation, and the focus of safety endeavours was extended to include human factors, including such things as the “man/machine interface”. Despite the investment of resources in error mitigation, human factors continue to be cited as a recurring factor in accidents. Human factors tended to focus on the individual, without fully considering the operational and organizational context. It was not until the early 1990s that it was acknowledged that individuals operate in a complex environment that included multiple factors which could affect behaviour.

8.2.5.1.3 During the mid-1990s, safety began to be viewed from a systemic perspective and began encompassing organizational factors as well as human and technical factors. The notion of an “organizational accident” was introduced. This perspective considered the impact of such things as organizational culture and policies on the effectiveness of safety risk controls. Additionally, routine safety data collection and analysis using reactive and proactive methodologies enabled organizations to monitor known safety risks and detect emerging safety trends. These enhancements provided the learning and foundation which lead to the current safety management approach.

8.2.5.1.4 There has long been an acknowledgement that system breakdowns or safety occurrences may reflect organizational problems. In recent years there has been a growing awareness that organizational issues such as management systems and corporate culture must be considered in an aircraft accident investigation.

8.2.5.1.5 The objective of the organizational investigation is to uncover characteristics of the organization which, although remote from the immediate circumstances of the accident, increased the probability of the accident occurring. These pre-existing, or latent, conditions, if not corrected, could become the cause of additional accidents.

8.2.5.1.6 From the beginning of the 21st century, many States and service providers had embraced the safety approaches of the past and evolved to a higher level of safety maturity. They have begun implementing SSP or SMSs and are reaping the safety benefits. However, safety systems to date have focused largely on



individual safety performance and local control, with minimal regard for the wider context of the total aviation system. This has led to growing recognition of the complexity of the aviation system and the different organizations that all play a part in aviation safety. There are many examples of accidents and incidents showing that the interfaces between organizations have contributed to negative outcomes.

- 8.2.5.1.7 The steady, compounding evolution of safety has led States and service providers to a point where they are giving serious consideration to the interactions and interfaces between the components of the system: people, processes, and technologies. This has led to a greater appreciation for the positive role people play in the system.
- 8.2.5.1.8 Safety benefits from collaboration between service providers, and between service providers and States. This perspective has nurtured multiple collaborative initiatives between service providers and an appreciation of the benefits of collaboration when addressing safety issues. The ICAO Runway Safety Programme is a good example.
- 8.2.5.1.9 For the collaborative total system approach to flourish, the interfaces and interactions between the organizations (including States) need to be well understood and managed. States are also beginning to recognize the role the total aviation system approach can play in their SSP development. For example, it helps to manage safety risks which cut across multiple aviation activities.

8.2.5.2 Organizational Investigation

8.2.5.2.1 The Reason Model and the Organizational Investigation

- 8.2.5.2.1.1 Accidents require the coming together of a number of enabling factors, each one significant but in itself not sufficient to breach system defences. Major equipment failures, or operational personnel errors, are seldom the sole cause of breaches in safety defences. Often these breakdowns are the consequence of human failures in decision-making. The breakdowns may involve active failures at the operational level or they may involve latent conditions conducive to facilitating a breach of the system’s inherent safety defences. Most accidents include both active and latent failures.
- 8.2.5.2.1.2 Figure 8-11 portrays an accident causation model that assists in understanding the interplay of organizational and management factors (i.e. system factors) in accident causation. Various “defences” are built into the aviation system to protect against inappropriate performance or poor decisions at all levels of the system: the front-line workplace, the supervisory levels and senior management. This model shows that while organizational factors, including management decisions, can create latent failure conditions that could lead to an accident, they also contribute to the system defences.

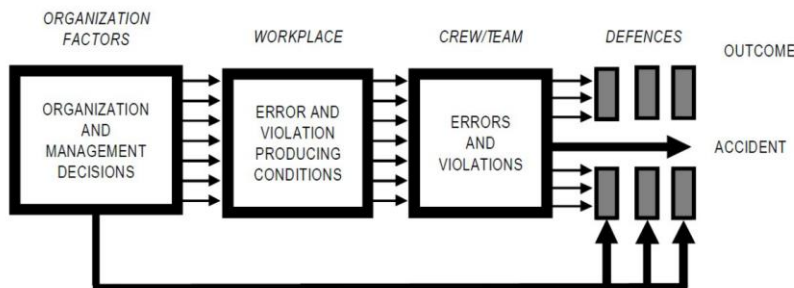


Figure 8-0-11: Accident Causation Model (Professor James Reason Model)



- 8.2.5.2.1.3 Errors and violations having an immediate adverse effect can be viewed as unsafe acts; these are generally associated with front-line personnel (pilots, controllers, mechanics, etc.). These unsafe acts may penetrate the various defences put in place to protect the aviation system by company management, the regulatory authorities, etc. resulting in an accident. These unsafe acts may be the result of normal errors, or they may result from deliberate violations of prescribed procedures and practices. The model recognizes that there are many error-producing or violation-producing conditions in the work environment that may affect individual or team behaviour.
- 8.2.5.2.1.4 These unsafe acts are committed in an operational context which includes latent unsafe conditions. A latent condition is the result of an action or decision made well before an accident. Its consequences may remain dormant for a long time. Individually, these latent conditions may appear harmless since they are not perceived as being system deficiencies.
- 8.2.5.2.1.5 Latent unsafe conditions may only become evident once the system's defences have been breached. They may have been present in the system well before an accident and are generally created by decision-makers, regulators and other people far removed in time and space from the accident. Front-line operational personnel can inherit defects in the system, such as those created by poor equipment or task design; conflicting goals (e.g. on-time service vs safety); defective organizations (e.g. poor internal communications); or bad management decisions (e.g. deferral of a maintenance item). Effective safety management efforts aim to identify and mitigate these latent unsafe conditions on a system-wide basis, rather than by localized efforts to minimize unsafe acts by individuals. Such unsafe acts may only be symptoms of safety problems, not causes.
- 8.2.5.2.1.6 Most latent unsafe conditions start with the decision-makers, even in the best-run organizations. These decision-makers are also subject to normal human biases and limitations, as well as to very real constraints of time, budget, politics, etc. Since some of these unsafe decisions cannot be prevented, steps must be taken to detect them and to reduce their adverse consequences.
- 8.2.5.2.1.7 Fallible decisions by line management may take the form of inadequate procedures, poor scheduling or neglect of recognizable hazards. They may lead to inadequate knowledge and skills or inappropriate operating procedures. How well line management and the organization as a whole perform their functions sets the scene for error, or violation-producing conditions. For example, how effective is management with respect to setting attainable work goals, organizing tasks and resources, managing day-to-day affairs, communicating internally and externally, etc.? The fallible decisions made by company management and regulatory authorities are too often the consequence of inadequate resources. However, avoiding the costs of strengthening the safety of the system can facilitate accidents that are so expensive as to bankrupt the operator.
- 8.2.5.2.1.8 For a comprehensive review of the Reason model, refer to Circular 247, Human Factors, Management and Organization.

8.2.5.2.2 The Six “M” Model for Organizational Investigation

- 8.2.5.2.2.1 Organizational investigation is to discover the effect of management actions and decisions on operations, maintenance and support activities. Therein, we find the influences present before an accident. The factors directly affected by management decisions and the interrelationship between them is critical to discovering the systemic factors that either led to the accident sequence of events or, at least, failed to intervene with adequate defenses. Figure 8-12 illustrates these factors.

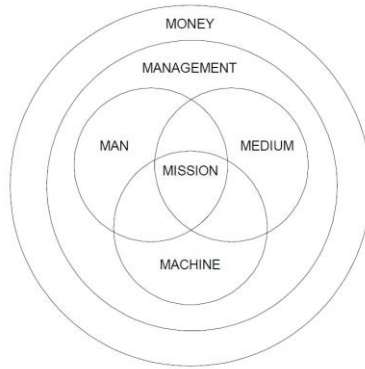


Figure 8-0-12: The Six “M” Model for Organizational Investigation

A. Formulation of the Mission

8.2.5.2.2.2 At the heart of the interrelationships are three factors which, together, provide the basis for the aircraft operation (the Mission) directly, the Man, the Machine and the Medium. Investigation into each of these individual factors is straight-forward and addressed in other sections of this manual. However, how the organization influences these factors should be investigated separately.

- a) The Man. Ultimately, if the accident flight was not conducted by the owner and operator directly, some organizational process was involved in selecting and designing the methodology used by this particular individual for the actions involved. It should be understood here that any discussion of “the Man” is not limited to the pilot or crew members. It may well apply to maintenance, dispatch, air traffic, designer personnel or any other personnel involved with the operation of aircraft, including government oversight.

Under this concept, the organizational policies on employment, scheduling, preparation for the individual’s activities, supervision of these activities and procedures for discipline should be scrutinized. For example, while a crew member may be directly responsible for obtaining sufficient rest prior to flight, the management organization may not have effective policy to protect that period and, in fact, may interrupt the rest period without consideration for the fatigue that may result. In this case, the organizational influence may well be identified as contributing to the overall effect.

- b) The Machine. While this normally refers to the aircraft, this area includes any equipment used to support the aircraft during maintenance or pre-flight preparation. Additionally, the equipment used to respond to the post-accident environment may also be considered. Again, direct investigation as to adequacy of the equipment is straightforward. However, how the organization involved procured the equipment, how the equipment is maintained and how individuals are trained in its use should be the focus of the organizational investigation. Selection of the particular equipment is an organizational decision. For example, if the equipment was a work-around because the organization had not procured the correct support equipment, then the organizational influence was directly involved.
- c) The Medium. This area includes the conditions under which the other actions take place. This area may include the weather at the time the actions were taken and whether the actions took



place during daylight or during periods of darkness. If in-flight, these may include whether the flight was in visual meteorological conditions or operating under instrument conditions.

8.2.5.2.2.3 The interrelationship of the above factors is just as critical as the components themselves.

These interfaces often become barriers to information exchange or coordinated management oversight.

- a) The Man-Machine interface. This area takes into that account any organizational actions which combine a piece of equipment with an individual who is in some way incompatible with that equipment. In aircraft, the design of the cockpit cannot accommodate all sizes of human beings. Designers use certain standards to allow the majority of individuals to have access to all controls or the ability to fully use the equipment. If an individual is too large, too small, has insufficient strength or another limiting factor, the organization should consider these limitations when selecting the individual or the equipment.
- b) The Man-Medium interface. The activity that surrounds the accident sequence should be considered in light of how the individual had to cope with the environment. For example, if the particular maintenance activity being investigated took place during the day, it may have involved activity under intense sun, involving blowing dust or precipitation and if the organization took no action to reduce the risk of error under these conditions, then the organization would be found contributing.
- c) The Machine-Medium interface. Compatibility of the equipment to effectively operate within the medium is central to an organization's decision to use the equipment. For example, it would not be prudent to operate an aircraft into an airfield when the only available runway was less than the certificated minimum field length. If the organization failed to consider the limitations under the environmental conditions anticipated, then its contribution is significant.

8.2.5.2.2.4 Together, these factors form the Mission: the activity the aircraft was engaged in at the time of the accident. The organization is responsible for assigning men, machines and conducting the anticipated activities in the existing medium. Acceptance of the risks involved make the organizational influences contribute to the accident analysis. The Mission may be simply to fly from point A to point B, but the choice of time, route and conditions to alleviate any anticipated risks set the stage for the events which ultimately led to the accident. If the task assigned to the aircraft and its crew is beyond the experience of the individuals involved, it is up to the organizational structure to provide adequate defenses to preclude undue risks.

B. Management

8.2.5.2.2.5 Organization's management administers the elements that make up the basic factors. This should include all levels of supervision from the most senior management officials to the supervisors of individuals directly involved. It encompasses all the factors discussed above because management at all levels promulgates the policy and standards of behaviour that create the corporate culture. This culture may be tolerant of deviations to existing rules when faced with an adverse or risk-increasing situation. Alternatively, the culture may be open to communication of these factors only to be thwarted by middle management indecision or interference. When encountered by the investigator, it must be determined whether the risk associated with the culture issue is directly or indirectly involved in the sequence of events leading to the accident. If so, it must be examined for causality. If not, then procedures reporting discovered deficiencies which have accident potential should be considered for the report.



8.2.5.2.2.6 Management issues should also be considered externally to the principle organization as well. In many cases, industry or government oversight organizations which issue, control and/or monitor operating certificates have their own influence on the way a latent condition or accident may occur. Just as it may be understandable when an individual faces a dilemma created by management's insistence on riskier actions, the entire organization's management may be influenced by an enthusiastic or an uninvolved oversight organization to the detriment of normal cautions afforded in the rules.

8.2.5.2.2.7 Procedures. Some areas governed by management or the oversight of the employees' actions might include procedures, as most organizations involved in aviation activities are required to establish procedures to assure regulators that operations and maintenance actions will be handled in an efficient and safe manner. Investigations into operations and maintenance should take these procedures into account. The organizational investigator must look for systemic issues that might lead procedures to create a safety problem – one that may not have been overcome by the individual's actions.

- a) These may include changes in flight operations requirements by operations between individual States. While ICAO procedures are designed to simplify these transitions, it is left to the individual States to create their own operational regulations. Aircraft transitioning between States may find conflicting procedures which must be complied with in addition to operating within their own State's guidelines.
- b) An organization may further restrict their operations by having procedures that "ensure" compliance with regulations and make management of personnel easier, for example, how an organization handles the crew's rest periods.
- c) Additionally, because many regulators require that operating procedures are in an operator's own format, the longer an organization operates a particular piece of equipment, the longer the organization has published their own procedures and has added steps that make their unique operating environment easier to handle. Additional procedures to combat corrosion may be implemented if the aircraft is continuously operated in a high moisture environment. Conversely, the anticorrosion procedures may be minimal when the aircraft is operated in a very low humidity environment. Over time, procedures originally issued by the manufacturer may become significantly amended by individual organization manuals and procedures. The organizational investigator must look for this gradual shift in procedures and the application of changing procedures from the origin (the manufacturer) to the implementation (the operator). Standardization and harmonization of these documents across a larger organization is a significant administrative burden that needs to be rigidly enforced, especially if there is not a central reference library. Otherwise, the various parts of the organization are acting under different versions and revisions of operative procedures.
- d) The transfer of information from detailed guidance contained in manuals and handbooks into operator's flight checklists or maintenance work cards should be examined with great care. An organization transferring critical data may inadvertently delete or re-arrange an action in a checklist or Work card. This action may leave the individual without adequate reference to apply the procedure correctly, especially when activity has increased in tempo such as during an in-flight emergency.

C. Funding



8.2.5.2.2.8 The term “funding” refers to the adequacy of resources. Given sufficient resources, organizations rarely expose their aircraft, personnel or the public to unnecessary risks. As resources become scarce, methods to stretch the remaining resources to keep the organization operating are employed. While these methods may not present an obvious risk increase, over extended periods the application of resource-saving techniques may create a management culture that allows an unacceptable risk to enter the picture with a disregard for its impact or with an acceptance of that risk as “normal operating procedures.”

8.2.5.2.2.9 Issues (beyond the obvious of financial resources) should be examined in this context.

- a) Availability of human resources. The availability of sufficient personnel to perform required functions is one area that should be investigated when a deviation from accepted practice occurs. In some cases, it has been discovered that while crew members or mechanics were well qualified, there were insufficient numbers of them to keep the existing regulations in perspective. When human resources were limited, compromises in qualifications, crew rest or other scheduling was the common result.
- b) Quality of human resources. Similar to the discussion above, at times the experience level of the various personnel should be evaluated in light of the accident sequence. While the worker and the supervisors may be individually qualified, their ability to continue quality work depends on the appropriate ratio of workers to supervisors and the experience levels of each. For example, one organization demonstrated that a specified number of maintenance personnel were employed. However, the organizational investigator found that among these employees, the number of supervisors was extremely lower of the number expected, while the number of trainees was higher than ideal. Another condition might exist where there are sufficient supervisors, but they are mostly assigned to daytime duties, when the majority of maintenance activities are conducted at nighttime with minimum supervision. Numbers of employees do not necessarily equate to the quality of work performed.
- c) Acquisition of parts and other commodities. In organizations under the pressure of inadequate resources, alternative methods of obtaining needed parts may be used. While the quality of parts may present the investigator with another problem completely, the organizational investigator is looking for the mind-set that puts safety at risk by using alternative methods. For example, an organization requiring parts to put the aircraft back into service was found to have taken the parts from another aircraft. While the practice alone does not increase risk, the fact remained that the aircraft from which the parts had been taken was becoming a “parts store” in order to delay the purchase of the needed parts. Eventually the paper trail of parts removed and re-installed became unwieldy and a breakdown in documentation occurred. This led to the accident aircraft having parts that were not documented in the maintenance logs and which led to installation errors.

8.2.5.2.3 Potential Problems in an Organizational Investigation

8.2.5.2.3.1 As occurrence factors become increasingly remote from the immediate time and place of the accident, the potential subjectivity of the investigation increases, as do the opportunities for disagreement amongst those with a stake in the investigation. This is not, however, justification for avoiding controversial organizational and systemic issues.



8.2.5.2.3.2 It should also be borne in mind that several organizations may be implicated in an accident, each with its own level of involvement. The organizational factors relating to each of these organizations should be considered separately.

8.2.5.2.3.3 In most cultures, there is a strong tendency to search for culpable individuals after an accident and a corresponding reluctance to consider the role institutions such as companies or government organizations may play. The organizational investigator must resist such pressures, yet still consider how an effective organizational investigation can be conducted consistent with the national culture.

8.2.5.2.4 Methodology

8.2.5.2.4.1 Since each organizational investigation is unique, it is not desirable to prescribe in detail how each investigation should be conducted. The method section below describes how the Reason model can be applied to an accident investigation. This model provides a useful checklist to ensure that issues are explored and can assist in writing up findings in a form that is consistent with publications such as Circular 247, Human Factors, Management and Organization and Circular 240, Investigation of Human Factors in Accidents and Incidents.

8.2.5.2.4.2 The Reason model is not the only possible method or framework that can be used in a systemic investigation. Other methods such as Management Oversight and Risk Tree (MORT), Human Factors Analysis and

Classification System (HFACS) and Threat and Error Management framework (TEM) may be useful and the organizational investigator should not feel compelled to limit the investigation to one particular model. The importance of using a systematic model or process is to ensure a thorough consideration of ALL aspects of the investigation, without pre-judging the causes or responsibilities for the deficiencies leading to the event.

A. The application of the Reason model to accident and incident investigation

8.2.5.2.4.3 The organizational investigator will often rely on other groups to identify active failures, local factors and failed or absent defenses. As this information becomes available, the organizational investigator will be in a position to consider the underlying organizational and systemic factors which enabled the situation to develop.

8.2.5.2.4.4 In the event of a major investigation, there may be daily briefings which will enable the organizational investigator to become aware of the progress of other groups. It may be appropriate, however, for the organizational investigator to arrange for a member of each group to act as a contact and report information which may have a bearing on organizational issues.

8.2.5.2.4.5 In the early stages of the investigation, the organizational investigator may need to attend or review key interviews conducted by other groups such as ATC or Operations. This will ensure that potential organizational issues are not being neglected during the interview. As the investigation progresses there may be a need to conduct interviews specifically directed at organizational issues.

8.2.5.2.4.6 In addition to relying on information from sources such as interviews and documents, the organizational investigator may choose to collect information via additional means such as structured survey interviews or questionnaires.



8.2.5.2.4.7 The organizational investigator should develop a listing of the organizations that played a role in creating potential local or systemic factors. For example, if the accident is remote from the organization headquarters, there may be an intermediate level of supervision involved. Similarly, when outsourcing is used, for example, for aircraft maintenance, there may be several contractual relationships established involving multiple organizations. In this case, the relationship between each organization should be well understood to identify breakdowns in the management oversight and communications. Finally, as the investigator comes to understand the organization's structure, there must be consideration of the government relationship with the organizations related to the issuing and continued oversight of the operations and/or maintenance certificates.

8.2.5.2.4.8 Potential organizational weaknesses may become apparent during the investigation. Yet these organizational weaknesses may have had no role in the development of the accident. If no evidence subsequently emerges to link these weaknesses with the active failures, local factors and defenses of the accident scenario, the organizational investigator should not list these weaknesses among the accident factors. Such findings should, however, be included in the accident report and, if applicable, they should be the subject of a safety recommendation. It might be appropriate to place such findings under the category of "additional information" in the accident report.

B. Potential local and systemic issues

8.2.5.2.4.9 In the following section, potential areas of concern are linked with possible questions which could guide an organizational investigator. These are by no means the only potential topics to be considered as part of an organizational investigation.

C. Corporate goals

8.2.5.2.4.10 Most organizations operate with goals which conflict from time to time, such as on-time performance and fuel saving. The manner in which the organization recognizes the conflict and balances goals with one another may be significant to the occurrence.

Does the organization have a formal statement of goals?

What are the performance expectations of owners, shareholders or government?

Does the organization have a quality policy?

Does the organization have a safety policy?

Organizational structure

8.2.5.2.4.11 This area includes factors relating to the structure and systems of the organization.

Do problems stem from the structure of the organization?

Are management responsibilities clearly defined?

What actions by managers and other staff are rewarded?



What actions by managers and other staff are punished?

D. Communications

8.2.5.2.4.12 Would the accident have been less likely if internal communications were better?

Do field stations communicate with headquarters?

Is upper management aware of operational realities?

E. Planning

8.2.5.2.4.13 Does the organization operate in a short-term environment?

Does the organization have difficulty in anticipating events?

F. Control and monitoring

8.2.5.2.4.14 Are there adequate systems in place to inform management of key performance indicators?

Does the organization have a hazard identification and risk management policy/Programme? Design of systems and components

8.2.5.2.4.15 Design factors are included as systemic factors because the design of systems and components is normally an activity remote from day-to-day systems operation. Some systems may not have been “designed” at all, but may have developed over time. Systems which are complex to the extent that their workings are not understood by operators (opaque systems) can be particularly problematic.

Did the designers receive feedback on the adequacy of the design?

Were there opportunities to modify the design?

Do operators understand the systems they use?

If complex technical systems are involved, is there a single person who has a general understanding of system operation?

G. Corporate memory

8.2.5.2.4.16 Have there been recent mergers or takeovers?

Does the organization have a well-maintained corporate memory?

Are there events remembered in the “folklore” of the organization which still influence the functioning of the organization?

H. Procedures



8.2.5.2.4.17 Is there a conflict between informal norms and formal procedures?

Would the organization fail to function if procedures were strictly adhered to?

Are there local orders/instructions that may conflict with organizational orders/instructions?

I. Resources

8.2.5.2.4.18 Does the organization have the resources to recruit and train staff, maintain equipment and operate responsibly?

Has the organization undergone a significant reorganization, or has it recently undertaken a significant reorganization that has resulted in the re-distribution of resources to different parts of the organization?

J. Regulation

8.2.5.2.4.19 How frequently do regulators visit the organization?

Are the regulators capable of administering the regulations?

Do the regulators have an available range of measures (such as sanctions) to encourage compliance?

Does the regulator require and oversee the organization's Safety Management System?

K. Adaptation to new technology

8.2.5.2.4.20 Has the organization reacted appropriately to new technologies?

L. Corporate culture

8.2.5.2.4.21 Does the organization condone risk taking?

Is safety an important goal of the organization?

Does the organization have a history of correcting problems?

Does the organization have a history of ignoring or covering up problems?

M. Safety management

8.2.5.2.4.22 Does the organization have a safety management programme?

Does the organization have a quality assurance programme?

Is there a safety division? If so, to whom does it report?

Has the organization recently been subject to an outside audit?



Has there been a formal hazard analysis of the operation?

8.2.5.2.5 Final Considerations

8.2.5.2.5.1 To be effective, investigations must consider the role of organizational factors, yet the investigation of such factors is likely to be heavily reliant on subjective judgment.

8.2.5.2.5.2 One of the most important subjective considerations in an investigation is knowing when to stop. Accident factors may be found far removed in time and distance from the accident itself and it may be difficult to know how widely the organizational investigation should extend. Such a decision will be influenced by the legal framework within which the investigating authority operates. A useful rule is that when the organizational investigator begins to arrive at circumstances which are beyond the control of managers, the investigation has exceeded reasonable bounds.

8.2.5.3 Investigating Human Factors

8.2.5.3.1 General

8.2.4.3.1.1 This portion of the manual is intended as a general guide to the investigation of the human contribution to aviation occurrences, which advocates a systems approach to the investigation. Whether the investigation is conducted by a single investigator or a team of investigators, the use of a systematic approach will ensure that the investigation of human factors is integrated within the investigation proper and not relegated to the rank of a residual capacity activity, something that happens only if one is allotted enough time and sufficient resources. For both the single investigator and the investigation team, the use of such an approach will make the occurrence investigation more efficient and more complete.

Objective

8.2.5.3.1.2 The objective of the investigation of human factors in occurrences is to advance aviation safety by:

- a) determining how breakdowns in human performance may have caused or contributed to the occurrence;
- b) identifying safety hazards as they relate to limitations in human performance; and
- c) making recommendations designed to eliminate or reduce the consequences of faulty actions or decisions made by any individual or groups involved in the occurrence.

Scope

8.2.5.3.1.3 To achieve such an objective, the collection and analysis of human factors information should be as methodical and complete as any other traditional area of the investigation, a requirement that forces the investigation beyond the examination of the actions of the aircrew to include an analysis of any individual or group involved in the occurrence, be it management, the regulator, or the manufacturer.

8.2.5.3.1.4 In a complex, interactive and well-guarded transportation system such as the aviation industry, accidents rarely originate from actions or non-actions of the front-line operators alone; accidents result from the interaction of a series of latent factors already in the system. In almost every facet of an investigation, from management and supervisory decisions to maintenance activities and pilot performance, one can identify



human performance factors that may help to explain the causal event sequence. An investigation that focuses on only the front-line operators acts as a barrier to the identification of systemic safety hazards and the opportunity to eliminate or reduce the consequence of safety hazards through the making of recommendations.

Overview

It provides guidelines on the integration of the human factor investigation with the overall investigation. The guidelines are equally applicable to the investigation by a single investigator responsible for all aspects of the investigation, as they are to the investigation where one or more investigators are dedicated solely to the human factor aspects of the investigation.

8.2.5.3.2 A Systems Approach to the Investigation of Human Factors

Human factors frameworks

- 8.2.5.3.2.1 In general, the human factors data that must be collected fall into two broad areas: information which will enable investigators to construct a detailed chronology of each significant event known to have occurred prior to and, if appropriate, following the occurrence (this chronology must place particular emphasis on the behavioral events, and what effect they may have had on the accident events sequence); and contextual information which will permit investigators to explain why the behaviour actually happened.
- 8.2.5.3.2.2 The human element can become involved in occurrences in three ways. The first way is as a direct contributor through an unsafe act. Generally, this tends to be an active failure by an operator at the scene of the occurrence and is often referred to as “operator, user or pilot error”. The second way, which also results in direct involvement, is as a receiver/user of unsafe conditions. The third way is an indirect contributor to either unsafe acts or conditions through an antecedent unsafe act or latent failure. This final manner of involvement emphasizes the interrelationships or linkages between unsafe acts and conditions and, therefore, underscores the need to consider various layers of underlying causes and contributing factors.
- 8.2.5.3.2.3 Following is a description of four frameworks - the SHELL model, Reason’s Model of Accident Causation, a Latent Unsafe Conditions Framework (LUC), and a Behaviour and Error Framework that will aid the investigator in gathering and analyzing relevant occurrence information to determine the various layers of underlying causes and contributing factors. Subsequent to the description of the four frameworks is a description of an investigative tool, the Integrated Process for Investigating Human Factors, which integrates the four frameworks into an investigative step-by-step process.

SHELL

- 8.2.5.3.2.4 The SHELL model (Figure 8-13), originally developed by Edwards (1972) and modified by Hawkins (1987), facilitates a systematic approach to data collection. Each component of the SHELL model (software, hardware, environment, and liveware) represents one of the building blocks of human factors studies.
- 8.2.5.3.2.5 The liveware, or the human element, is the centerpiece of the model, representing the most critical and flexible component. The person represented by this component could be any person involved with the operation of a flight, and thus the component should not be considered restricted to aircrew. Each person



within this central component brings his or her own limitations and strengths, be they physical, physiological, psychological, or psychosocial.

8.2.5.3.2.6 The central human component does not act on its own; it interacts directly with each of the others. The edges of this human block are not simple and straight, so other blocks must be carefully matched to them if stress and eventual breakdown (an accident) are to be avoided. The investigation of human factors must identify where mismatches between components existed and contributed to the occurrence, and so the data collected during the investigation should permit a thorough examination and analysis of each of the SHELL components and its interactions with the central component.

- a) Liveware-Hardware (Human-Machine). This interaction includes any physical or mental interactions between the human and the machine, design limitations and peculiarities in workstation configuration.
- b) Liveware-Software (Human-System). This interaction concerns the nature of the information transfer between the human and supporting systems such as checklists, manuals, training, procedures, and regulations.
- c) Liveware-Environment (Human-Environment). This interaction subdivides into two areas:
 - i) Internal: personal comfort and physical working conditions.
 - ii) External: weather, aerodrome surroundings and infrastructure.
- d) Liveware-Liveware (Between People). This interaction explores the nature of human interactions and communication breakdowns between individuals.

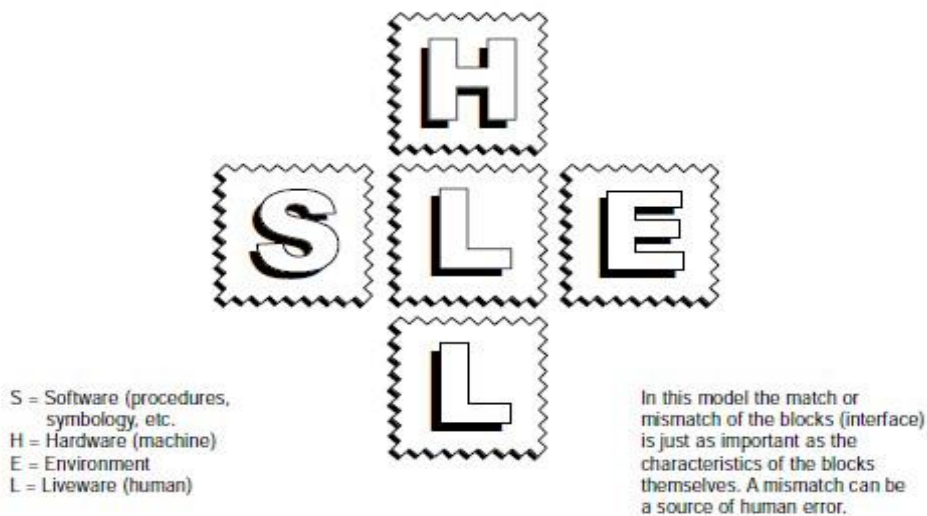


Figure 8-0-13: SHELL Model (Adapted from Hawkins, 1975)



Reason's model of accident causation

8.2.5.3.2.7 A framework proposed by James Reason (1990) explains how humans contribute to the breakdown of complex, interactive, and well-guarded systems such as the aviation industry. In such a system, accidents rarely originate from active failures or unsafe acts of front-line operators alone.

According to Reason, accidents result from the interaction of a series of flaws, or latent failures, already present in the system (Figure 8-14).

8.2.5.3.2.8 The two types of failures, active and latent depend upon the immediacy of their consequences. An active failure is an error or violation which has an immediate adverse effect. Active errors are usually made by the front-line operator. A pilot raising the landing gear lever instead of the flap lever exemplifies this failure type. A latent failure is a result of a decision or an action made well before an accident, the negative consequences of which may lie dormant for a long time. These failures usually originate at the decision-maker, regulator, or line management level, that is, people far removed in time and space from the event. A decision to merge two companies without providing training to standardize operating procedures illustrates the latent failure. These failures can also be introduced at any level of the system by the human condition — such as policies that lead to poor motivation or fatigue.

8.2.5.3.2.9 Latent failures, which originate from questionable decisions or incorrect actions, although not harmful if they occur in isolation, can interact to create a “window of opportunity” for a pilot, an air traffic controller, or mechanic to commit an active failure which breaches all the defenses of the system and results in an accident. The front-line operators are the inheritors of a system's defects. They are the ones dealing with a situation in which technical problems, adverse conditions, or their own actions will reveal the latent failures present in a system. In a well-guarded system, latent and active failures will interact, but they will not often breach the defenses. When the defenses work, the result is a minor event or at most an incident; when they do not, it is an accident.

- a) Upper management decisions. Amongst these latent failures are decisions made by upper management, an aviation company's corporate managers or regulatory officials. When allocating resources, management has to balance, among other things, safety against cost. These objectives can conflict and may result in flawed decisions which will be reflected throughout the system.
- b) Line management deficiencies. Managerial decisions, including those that are flawed, have to be implemented by line management through their standard operating procedures, training programmes, flight and crew scheduling, etc. If deficiencies also exist at this level, they will increase the accident potential of those managerial decisions; for example, dispatch who has inadequate appreciation for operational conditions may jeopardize safety by trying to follow a policy which is not appropriate for the situation.
- c) Existing preconditions. If certain characteristics or preconditions, such as an unproductive environment, poorly motivated or unhealthy workforce, machines in a poor working state, and poorly established procedures are present in the system, they will influence the front-line operation's actions and become a source of unsafe acts.
- d) Latent failures. Flawed decisions at the managerial levels, line management deficiencies, and existing preconditions at the worker level represent the system's latent failures.
- e) Unsafe acts. Unsafe acts take many forms and, because of error, can never be totally eliminated.



- f) Defences. In a complex and well-guarded system, these latent failures may lie dormant for a long time without having significant impact on safety because very effective defences, such as checks, procedures or Ground Positioning Warning System (GPWS), allow for a great number of these flaws to be simultaneously present in the system without serious consequences.
- g) Window of opportunity. An accident trajectory occurs when unsafe acts interact with latent failures present in the system and breach all the system defences, thus creating a “Window of opportunity” for an accident to occur.
- h) Summary. Many unsafe acts are committed without consequence because existing conditions did not favour an interaction of all the deficiencies present in the system. Investigators, therefore, should not only examine unsafe acts made by front-line operators, but should work their way from unsafe acts and inadequate or removed defences, through the accident trajectory, all the way back to upper management levels. Addressing the higher levels’ deficiencies, in addition to the ones closely related to the unsafe acts, allows the investigator to formulate preventive measures which will affect a larger set of occurrences.

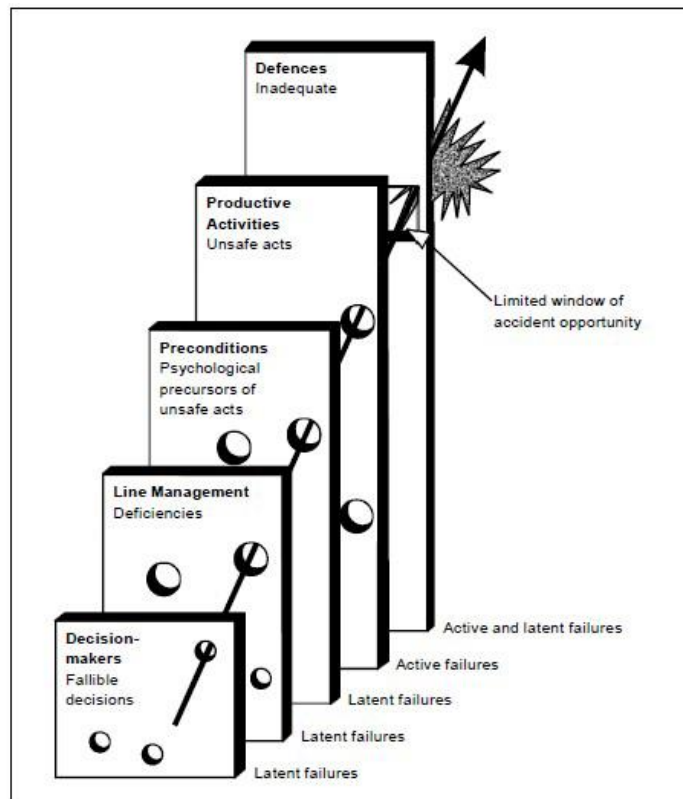


Figure 8-0-14: Reason’s Model

Latent Unsafe Conditions (LUC) framework

8.2.5.3.2.10 The LUC framework is an extension of the Reason model, with an emphasis on a systematic means for examining personal and organizational factors. This framework comprises the elements of the SHELL model within the Reason concept of latency. Latent unsafe conditions include all those latent factors in the



transportation system which can adversely affect safe operations or maintenance. They include latent factors at both the personal and the organizational level and may be referred to as LUC factors. It should be noted that an element of chance is involved in occurrences in the sense that operations may be conducted year after year under the same unsafe conditions without consequence; however, on any given day, an additional element of “bad luck” is added to the equation and tragedy results. Hence, the abbreviation LUC is a reminder of this element of chance.

8.2.5.3.2.11 Personal latent unsafe conditions (P-LUC factors) include those factors such as the state of mind of the individual, physical wellbeing, etc.; such factors can adversely affect the safety of operations or maintenance activities. Similarly there are organizational latent unsafe conditions (O-LUC factors); i.e. those factors beyond the purview of the individual which have the potential for adversely affecting personal or team performance in operations or maintenance.

Personal LUC factors

8.2.5.3.2.12 Latent unsafe conditions at the personal level are known as P-LUC factors. These factors may limit or degrade an individual’s expected performance, resulting in an error of some type. The potentially adverse effects of P-LUC factors may be amenable to mitigation by the individual or by the organization, if they are identified in time. Aside from collecting the facts at the individual level, it may be difficult for the transportation system to address “personal” problems. However, sometimes a P-LUC factor will be indicative of a more systemic Organizational LUC factor, which is conducive to broad remediation. P-LUC and O-LUC factors are illustrated within the Reason framework in Figure 8-15 below.

8.2.5.3.2.13 The P-LUC factors are sometimes referred to as the physical, physiological, psychological, and psychosocial factors.

Organizational LUC factors

8.2.5.3.2.14 Latent unsafe conditions at the organizational and management level are known as O-LUC factors. Company management practices, the regulatory climate, and even the attitudes of workers fostered by professional associations can adversely affect human performance in both operations and maintenance. Following are some of the principal O-LUC factors:

a) **Design:**

- 1) Poor technical design of equipment, including inadequate consideration of the human/machine interface requirements for avoiding human error.
- 2) Poor task design, failing to take into account all the SHELL model interfaces.

b) **Personnel:**

- 1) Inadequacies in the initial (and ongoing) selection of personnel with the requisite knowledge, skills and attitudes for safe and efficient job performance.
- 2) Deficiencies in the knowledge and skills of employees which are necessary for them to do their jobs safely, resulting from training inadequacies.

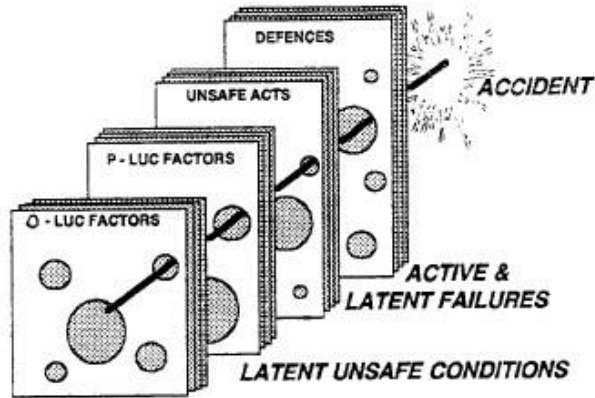


Figure 8-0-15: Latent Unsafe conditions within the Reason framework

- 3) Scheduling practices for operating or maintenance personnel which may compromise individual or team performance.
 - 4) Inadequacies in personnel monitoring and support programmed to ensure the continuing fitness of employees for their specified duties.
 - 5) Remuneration practices which provide employees with incentives to cut corners.
- c) Procedures and accepted operating practices:
- 1) Company-prescribed procedures which are difficult to follow, ambiguous, incomplete, incorrect, inaccessible or absent.
 - 2) Accepted operating or maintenance practices which differ from prescribed procedures and create conditions that might lead to errors.
- d) Communications:
- 1) Information necessary for safe and effective operations and maintenance is not sent, received or understood by the intended recipients in a clear, unambiguous and intelligible form.
- e) Organization:
- 1) Deficiencies in the operating philosophy and policies of the organization which create error conducive conditions.
 - 2) Incompatible organizational goals in that production goals are in conflict with the maintenance of a safe operating environment.
 - 3) Deficiencies in either the structure of the organization or its way of conducting business which inhibit effective internal communications between management and operations or maintenance.
 - 4) Deficiencies in the organization's safety climate which allow safety responsibilities to be ill-defined and warning signs to be overlooked.
- f) Work environment:
- 1) Conditions conducive to committing unsafe acts or making safety related errors due to physical conditions in the workplace which influence individual or team performance.



- g) Regulatory overview:
 - 1) Deficiencies in the rules and regulations governing transportation operations and maintenance.
 - 2) Deficiencies in the certification of equipment, personnel and/or procedures.
 - 3) Deficiencies in the surveillance, audit and inspection of transportation operations and maintenance.
- h) Associations and unions:
 - 1) Philosophies, policies, or practices which create conditions conducive to human error and unsafe acts.
- i) Defenses:
 - 1) Deficiencies in the identification and dissemination of known risks and how to manage them; i.e. safety awareness.
 - 2) Deficiencies in providing personnel with adequate detection and warning systems to see an unsafe event unfolding in time to prevent it.
 - 3) Deficiencies in the system's 'error tolerance' such that recovery from an unsafe condition is difficult without sustaining injury or damage.
 - 4) Deficiencies in the emergency response capabilities of the system which aggravate the consequences of an accident.

8.2.5.3.2.15 These Latent Unsafe Conditions in organization and management provide the operational context for human errors by operators and maintainers. Each LUC factor represents a potential hazard which can be systematically identified, validated, and corrected.

Behaviour and error framework

8.2.5.3.2.16 The following is a description of modes of behaviour, human error, and the interaction between behaviour and error. The behaviour/error framework has been adapted primarily from Rasmussen's (1987) taxonomy of behaviours and Reason's (1990) generic error-modeling system (GEMS) framework which facilitates the linkage of an error to an individual's level of performance (i.e. behaviour) at the time the failure occurred.

Modes of behaviour

8.2.5.3.2.17 To understand the ways in which people err, it is necessary to first look at the ways in which they behave. Rasmussen (1987) has identified a taxonomy of behaviours which provides a description of performance based on three different levels of decision-making. The following are descriptions of these three performance levels.

- a) Skill-based performance describes behaviour for a person engaged in a well-learned activity. Actions tend to be based on stored routines; skill-based performance is largely an automatic response where there is little, if any, conscious decision-making;
- b) Rule-based performance is less automatic. Decisions are based on learned procedures; these procedures are stored in long-term memory and require the involvement of the central decision maker and working memory because rule-based behaviours are actioned at the conscious level.



Response is governed by an “if-then” algorithm, such as “if this is the situation, then this is the diagnosis; if this is the diagnosis, then this is the remedial action”; and,

- c) Knowledge-based performance is behaviour that arises when an operator is faced with novel situations for which there are few pre-established rules, but which require that appropriate action be taken. Without rules to guide, decisions are based on the operator’s knowledge and experience.

Having categorized behaviour using the skill-rule-knowledge-based taxonomy, one can examine how people fail while operating within the behavioural modes.

Human error

8.2.5.3.2.18 There are two distinct categories of error, those actions that deviate from intention or are unintended (i.e. actions that do not proceed as planned) and those that are intended (i.e. actions that proceed as planned, but they fail to achieve the desired consequences). Errors can be further broken down into types, and the type depends largely on examining the concept of intended action. It is important to note that the criteria of “intentionality” refers to the action itself and not the intention to err.

- a) Unintended actions. “Was the action that was carried out, the action that was planned?” If the answer to that question is no, then an unintentional action occurred. An unintentional action resulting in an error arises from a failure in the execution of the action in that there was a difference between what action was supposed to have occurred and what action actually did. An error in execution is either a slip or a lapse.

Slips usually arise as the result of not paying sufficient attention to the execution of the action. For example, an operator reaches for a switch, without looking, and places the control in the “OFF” position from the “STANDBY” position, when the intent was to place the switch control in the “ON” position.

A lapse is an unintentional action where there is a memory failure. For example, a person following a series of instructions may forget one of the steps involved in a task.

Whether the error is a slip or a lapse, the planned action is the correct action for the situation; however, the operator fails to execute the action properly.

- b) Intended actions. “Was the action that was carried out, the action that was planned?” If the answer to that question is yes, then it is an intended action. An intentional action resulting in an error or violation involves a failure in planning in that the intended action was inappropriate. An error in planning is either a mistake or a violation. With this error type, the action proceeds exactly as planned but fails to achieve the desired consequences; in other words, the error is in the planning — it is the incorrect action for the situation. Mistakes are often failures of thought and of the decision-making process.

They are usually more subtle than slips and lapses and considerable time can pass between the execution of the erroneous action and its detection.

Mistakes, where there is no desire to do the wrong thing, can be distinguished from a violation where a deliberate decision to act against a rule or plan has been made. The term violation denotes a calculated adjustment or modification of a rule or plan which differentiates it from the basic error types as defined by the slip, lapse and mistake.



8.2.5.3.2.19 Despite the deliberate actions, some violations (i.e. routine and exceptional violations) involve people trying to “do the right thing” and differ from sabotage where there is malicious purpose. Routine violations occur every day as people regularly modify or do not strictly comply with work procedures, often because of poorly designed or defined work practices. In contrast, an exceptional violation tends to be a one-time breach of a work practice, such as at Chernobyl where safety regulations were deliberately ignored in order to carry out a safety test. However, the goal was not to commit a malicious act, but actually to improve system safety.

Behaviour/error framework

8.2.5.3.2.20 Reason’s GEMS (1990) provides a framework that combines Rasmussen’s skill-rule-knowledge-based behaviour taxonomy with the basic human error types, the result of which yields the following:

- 1) skill-based slips and lapses;
- 2) rule-based mistakes; and
- 3) knowledge-based mistakes.

An argument has been forwarded that violations are typically rule-based and only sometimes knowledge-based (Glendon and McKenna, 1995). However, since an assessment or evaluation of information (e.g. a rule or plan) is associated with a violation, this type of failure would appear to occur most often at the knowledge-based level of performance (Hudson, 1991).

- a) Skill-based slips and lapses. If the error involves skill-based performance, then a slip or a lapse would have occurred due to either inattention or over attention. Inattention is the failure to make a necessary attentional check on progress; over attention involves making the attentional check, but at an inappropriate time in the action sequence. Inattention may result from something as simple as an interruption; in that case, the operator omits the required check because he or she is interrupted or distracted by some external event, such as a radio call interrupting a checklist procedure, resulting in the operator’s missing one of the checks. Over attention may also result in an omission. Should the operator believe that the action sequence is further along than it actually is, a necessary step in the sequence can be omitted.
- b) Rule-based mistakes. If the error involves rule-based performance, then a mistake occurred because either a bad rule was applied or a good rule was misapplied. A bad rule is one that is either incorrect, ineffective or inadvisable (refer to Appendix 1 to Chapter 16 for further discussion of failure modes at the rule-based level). A good rule is one that has proven to be useful under given circumstances. An error involving a misapplication of a good rule is one where the applied rule is no longer appropriate for the particular circumstances. (See ICAO Doc 9756 Part III Appendix 1 to Chapter 16 for examples of failure modes at the rule-based level.)
- c) Knowledge-based mistakes. When no rules apply to a given situation, new solutions or plans must be formulated (Hudson, 1991). An error that is a mistake, that occurs during the formulation of the solutions or plans falls within knowledge-based performance. These errors occur because the operator is without all the information required to form an accurate mental model of the problem space. Failure modes at this level can arise from biases such as confirmation bias where



the operator seeks information that will confirm what he or she already believes to be true and discounts information that is inconsistent with the chosen hypothesis. (See ICAO Doc 9756 Part III Appendix 1 to Chapter 16 for examples of failure modes at the knowledge-based level.)

An Integrated Process for Investigating Human Factors

8.2.5.3.2.21 The work systems/organization and human error/behaviour frameworks, described in 8.2.5.3.2.1 to 8.2.5.3.2.20 provide investigators with a focus on the potential unsafe conditions that an investigation of human factors strives to uncover. The following is a process that integrates those frameworks into a step-by-step systematic approach for use in the investigation of human factors. Refer to Appendix 2 to Chapter 16 of Doc 9756 Part III for greater detail of each step in the process.

8.2.5.3.2.22 The process can be applied to both types of occurrences, i.e. accidents and incidents.

Illustrated in Figure 8-16, the process consists of seven steps:

- 1) collect occurrence data;
- 2) determine occurrence sequence; and
- 3) identify unsafe acts (decisions) and unsafe conditions; and then for each unsafe act (decision),
- 4) identify the error type or adaptation;
- 5) identify the failure mode;
- 6) identify behavioural antecedents; and,
- 7) identify potential safety problems.

8.2.5.3.2.23 Steps 3 to 6 are useful to the investigation because they facilitate the identification of latent unsafe conditions. Step 7, the identification of potential safety problems is based extensively on what factors were identified as behavioural antecedents.

Note.- At times, an unsafe condition may be a result of a natural occurrence. At other times, an unsafe act or decision may result from an unsafe condition which itself was established by a fallible decision. In the former case, the investigator may jump from Step 3 to Step 7; in the latter case, the investigator should proceed through Steps 3 to 7.

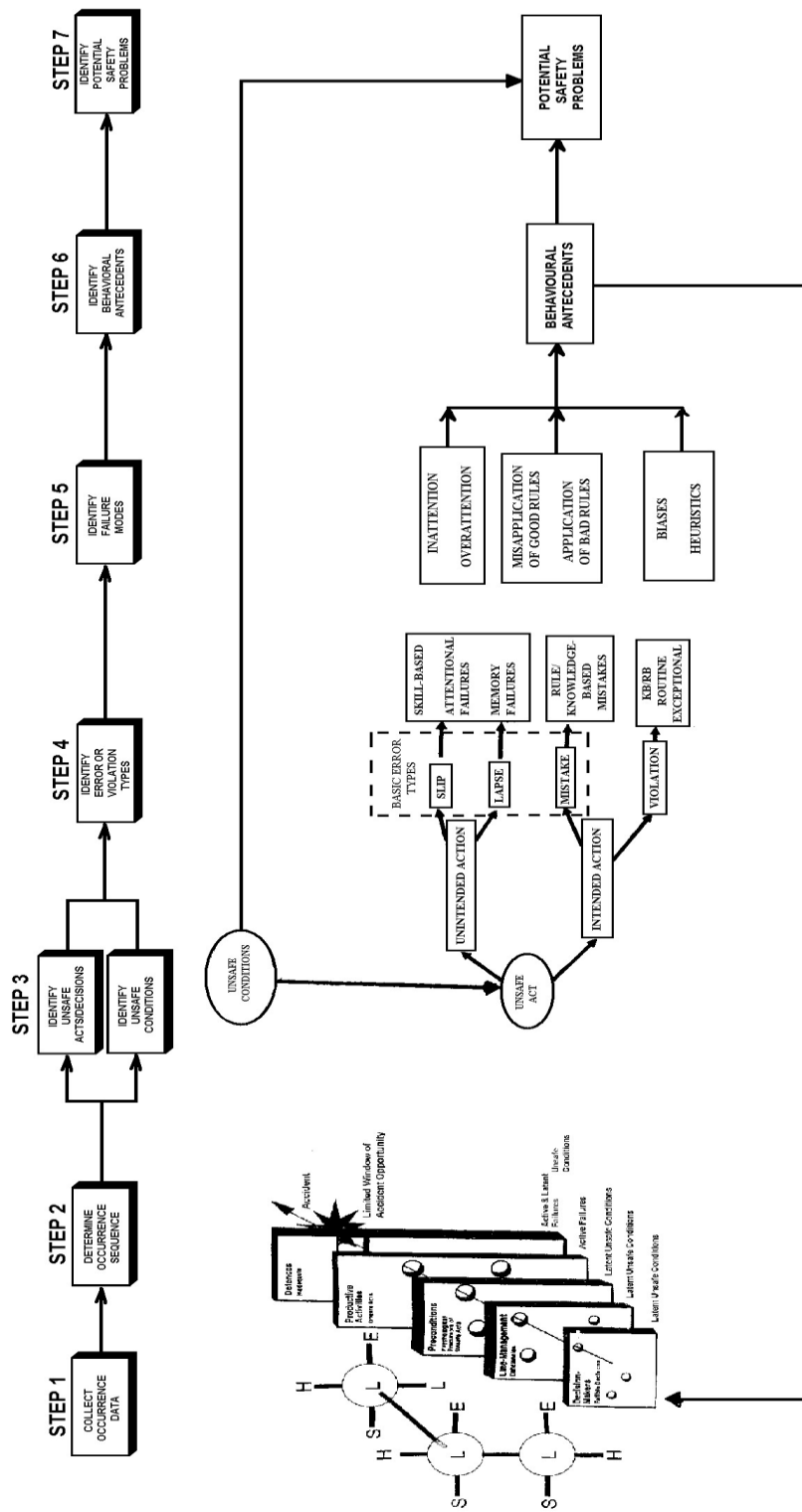


Figure 8-0-16: Integrated process for occurrence investigation



Step 1 - Collect occurrence data

8.2.5.3.2.24 The first step in the human factors investigation process is the collection of work-related information regarding the personnel, tasks, equipment, and environmental conditions involved in the occurrence.

8.2.5.3.2.25 For complex systems, where there are numerous interactions between the component elements, there is constant danger that critical information will be overlooked or lost during an investigation. Use of the SHELL model as an organizational tool for the investigator's workplace data collections helps avoid problems downstream because:

- a) it takes into consideration all the important work system elements;
- b) it promotes the consideration of the interrelationships between the work system elements; and
- c) it focuses on the factors that influence human performance by relating all peripheral elements to the central liveware element.

8.2.5.3.2.26 Figure 8-17 below is an adapted illustration of how this model can be applied to a complex system where multiple liveware, hardware, software and environmental elements exist.

Step 2 - Determine occurrence sequence

8.2.5.3.2.27 As the investigator moves to addressing questions of "how and why", there is a need to link the events and circumstances identified in the first step of the process. Reason's (1990) model of accident causation, utilizing a production framework, can be used by an investigator as a guide to developing an occurrence sequence. As well, Reason's model facilitates further organization of the work system data collected using the SHELL model, and an improved understanding of their influence on human performance. The occurrence sequence is developed by arranging the information regarding occurrence events and circumstances around one of five production elements, i.e. decision makers, line management, preconditions, productive activities, and defenses.

8.2.5.3.2.28 These production elements themselves are basically aligned in a temporal context. This temporal aspect is an important organizing factor since the events and circumstances that can lead to an accident or incident (and would therefore be causal factors) are not necessarily proximate in time, nor in location, to the site of the occurrence. By establishing a sequential ordering of the causal data, Reason's (1990) concept of active versus latent factors is introduced (refer to 8.2.5.2. 7 to 8.2.5.2.9).

8.2.5.3.2.29 In practice, Steps 1 and 2 may not be mutually exclusive. To facilitate this concurrent activity, the SHELL and Reason models can be combined as illustrated in Figure 8-18.

Steps 3–5 — An overview

8.2.5.3.2.30 Steps 3 to 5 are based upon the behaviour and error framework discussed above. The framework provides "pathways" that lead from the identification of the unsafe act/decision (Step 3) to the identification of what was erroneous about the action or decision (Step 4) and finally to its placement within a behavioural context (i.e. a failure mode within a given level of performance in Step 5. The behaviour and error framework as illustrated in Figure 8-19 is particularly useful in exploring hypothetical reconstructions of the occurrence facts.



Step 3 - Unsafe acts/decisions and conditions

8.2.5.3.2.31 In Step 3 of the process, the investigation and/or analysis is simplified where the information gathered and organized using the SHELL, Reason, and LUC frameworks is used to initiate identification of unsafe acts/decisions and conditions. There may be several acts, decisions and/or conditions which are potential unsafe candidates, thus necessitating iterative assessments of the occurrence facts. The SHELL and Reason hybrid model (refer to Figure 8-18 can provide a useful base for conducting such iterative assessments.

8.2.5.3.2.32 The data collected during an investigation (i.e. events and circumstances) can be organized, using multiple components of the modified SHELL model, into a framework surrounding an occurrence template (in this case the accident scenario), based upon the Reason model. In this way, each occurrence can be described by a unique framework of events and circumstances, the investigator being interested in identifying those which constitute the occurrence’s unsafe acts/decisions and conditions.

8.2.5.3.2.33 When an unsafe act, decision or condition is identified, the focus shifts to determining the genesis of that particular act. Further investigation and/or analysis may reveal other unsafe acts/decisions or conditions antecedent to the causal factor that was initially identified.

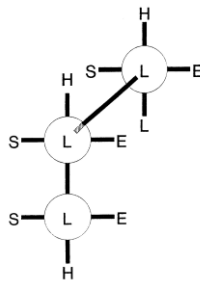


Figure 8-0-17: Modified SHELL Model

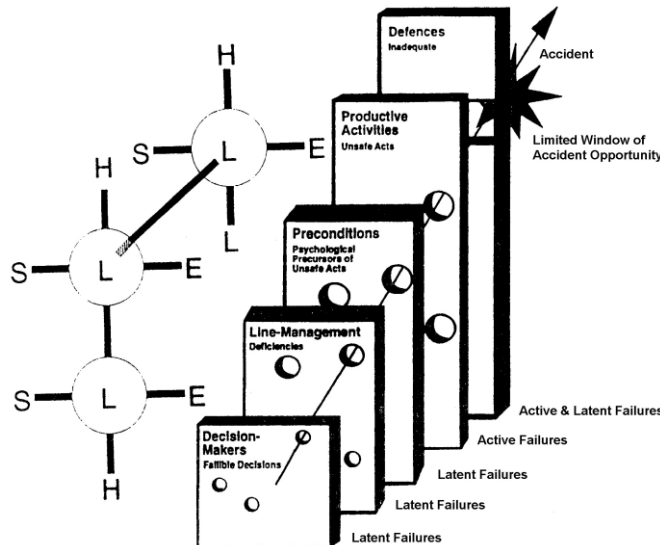


Figure 8-0-18: SHELL and Reason Hybrid Model



8.2.5.3.2.34 The last unsafe act precipitating the occurrence often provides a convenient starting point for reconstruction of the occurrence.

8.2.5.3.2.35 For example: Following Steps 1 and 2, an investigator determines that one of the unsafe acts was the failure to complete a checklist item.

Note — This example will be used and built upon throughout this section to illustrate the process.

Step 4 - Identify error or violation type

8.2.5.3.2.36 Step 4 is initiated for each unsafe act/decision by posing the simple question, “What is erroneous or wrong about the action or decision that eventually made it unsafe?” (Refer to 8.2.5.2.8 for elaboration of the terms used throughout this step.)

8.2.5.3.2.37 The identification of the type of error or violation involves two sub-steps. (See Figure 8-19.)

- 1) Unintended or intended action. First, determine whether the error or violation was an unintended or intended action.
- 2) Error type or violation. The second sub-step is the selection of error type or violation that best describes the failure, keeping in mind the decision regarding intentionality. There are four potential error/adaptation categories, i.e. slip, lapse, mistake and violation.

— A slip is an unintentional action where the execution failure involves attention.

— A lapse is an unintentional action where there is a memory failure.

— A mistake is an intentional action, but there is no deliberate decision to act against a rule or plan.

— A violation is a planning failure where a deliberate decision to act against a rule or plan has been made.

8.2.5.3.2.38 For example: Continuing with the unsafe act described above, the investigator determines that the unsafe act of not completing a checklist item was unintentional and that it was due to a slip because the operator did not attend to a step in the sequence.

Step 5 - Identify failure modes

8.2.5.3.2.39 In Step 5, the focus is now placed on the decision that eventually led to the erroneous action or decision identified in Step 3. This is accomplished by placing the errors (slips, lapses and mistakes) and violations into the context of performance (behaviour), i.e. how was one performing at the time of the failure?

8.2.5.3.2.40 The GEMS (Generic Error Modeling System) framework facilitates the linkage of an error/violation to an individual’s level of performance at the time the failure occurred. By following through to the next step (refer to Figure 8-20), one can begin to understand how errors and violations can have their roots in common behavioural failure patterns (i.e. failure modes) and are not necessarily the result of irrational behaviour.

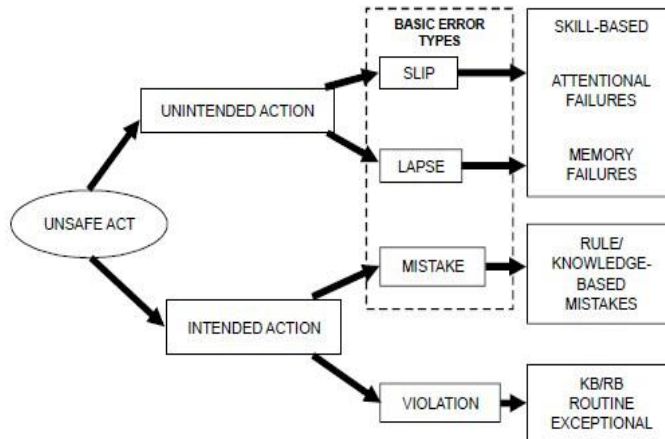


Figure 8-19: The GEMS Framework (adapted from Reason, 1990)

8.2.5.3.2.41 Recalling from 8.2.4.3.16 to 8.2.4.3.20, the error types and violations are matched against three categories of behaviour, resulting in the following:

- 1) skill-based - slips and lapses during skilled-based performance where actions tend to be based on stored routines and there is little, if any, conscious decision-making;
- 2) rule-based – mistakes are involved in rule-based performance where decisions are based on learned procedures; and
- 3) knowledge-based – mistakes and violations occur during knowledge-based performance where decisions are based on knowledge and experience (no set procedures) which necessitates evaluations.

8.2.5.3.2.42 Within each level of performance (i.e. behavioural category), there are different ways or modes a failure can occur (refer to Figure 8-20 for general descriptions of these failure modes). The errors and violations identified in Step 4 can be related to the failure modes as demonstrated by following a given pathway from Figure 8-19 to Figure 8-20.

8.2.5.3.2.43 For example: Having determined that the unsafe act of not completing a checklist item was unintentional and the error type was a slip, the investigator matches the error type to the performance level and determines that the operator was in skill-based behaviour. The failure modes that occur in skill-based behaviour are listed in ICAO Doc 9756 Part III Appendix 1 to Chapter 16. In the example, the investigator, having pieced together the accident scenario, knows that, while carrying out the checklist procedure, the pilot was contacted by ATC and given a departure clearance. The investigator then identifies that one of the failure modes at the skill-based level is omission following interruption which is characterized by a required check being interrupted by some external event. In this failure mode, the original action sequence, i.e. carrying out the checklist procedure, continues, but with one or more of the items omitted. In the case of the example, the two tasks, monitoring the checklist and copying out the departure clearance, competed for the same attentional resources and checklist monitoring suffered.



SL-AAIB Policy and Procedures Manual

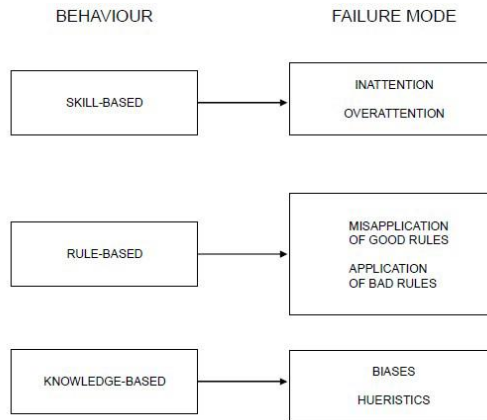


Figure 8-20: Breakdown of behaviour into failure modes

Step 6 - Identify behavioural antecedents

8.2.5.3.2.44 In Step 5, the focus was placed on the identification of failure modes which described erroneous decision-making or unsafe acts. To uncover the underlying causes and contributing factors behind the decision of an individual or group, it is important to determine if there were any factors in the work system that may have facilitated the expression of the given failure mode (and hence the error/violation and the unsafe act). These factors have been termed behavioural antecedents. The behavioural antecedents can be found by examining the work system information collected and organized using the SHELL, Reason, or LUC frameworks in Steps 1 and 2. The re-examination of these data again emphasizes the iterative nature of this investigative process where it may even be deemed necessary to conduct further investigations into the occurrence.

8.2.5.3.2.45 The three performance or behaviour levels can be broken down into common behavioural failure patterns or modes of failure. Descriptions of these failure modes are provided in ICAO Doc 9756 Part III Appendix 1 to Chapter 16.

8.2.5.3.2.46 For example: In re-examining the data gathered, the investigator discovers one of the behavioural antecedents is the design of the checklist itself. The checklist is paper; there are no aids incorporated into the checklist that will enable the pilot to keep track of the checklist sequence. In the absence of such aids, the onus is on the pilot to ensure that an item is not missed. By identifying the design of the checklist as problematic, the investigator has uncovered a latent unsafe condition in the system. Such latent unsafe conditions in organization and management are the behavioural antecedents to unsafe acts and decisions by operators and maintainers. They represent potential hazards which can be systematically identified, validated and corrected.

Step 7 - Identify potential safety problems

8.2.5.3.2.47 At Step 7, the investigator flags those unsafe latent conditions that occurred naturally or those that occurred as a result of a fallible decision as potential safety problems. For the most part, the identification of potential safety problems is based extensively on what factors were identified as behavioural antecedents. Once again this underscores the importance of the application of a systematic approach to Steps 1 and 2 of the process which sets the foundation for the subsequent analysis steps.



8.2.5.3.2.48 Where appropriate, the potential safety problems can be further analyzed to identify safety deficiencies and recommendations for safety actions.

Summary

8.2.5.3.2.49 The Integrated Process for Investigating Human Factors was developed as a tool to be used by investigators and analysts to facilitate the identification of direct and underlying unsafe conditions in transportation occurrences. The frameworks, which provide the foundation for the process, were drawn from the human factors literature since the human element has been identified as a significant contributor to occurrences. The final step of the process is the identification of potential safety problems which, in turn, may be used to identify systemic safety deficiencies.

8.2.5.3.3 Investigative Activities

Gathering information

8.2.5.3.3.1 The success of the human factors investigation depends largely on the quantity and quality of the information collected. As each occurrence is different from the other, the investigator will need to determine the type and quality of data to be collected and reviewed. As a rule, the investigator should be over-inclusive in gathering information initially and eliminate superfluous data as the investigation unfolds.

8.2.5.3.3.2 Use the SHELL conceptual model previously described as a tool to orient the data collection phase. In general, collect facts that will allow you to:

- a) construct a history of all significant behavioural events known to have occurred;
- b) thoroughly examine and analyse the SHELL interfaces to determine if and where breakdowns existed;
- c) determine what might have influenced or motivated a particular action, of all persons involved in the occurrence; and
- d) fully support the existence of an identified safety deficiency.

Sources of information

8.2.5.3.3.3 Information relevant to an aviation occurrence can be acquired from a variety of sources. Primary sources relating specifically to human factors include hardware evidence, paper documentation, audio and flight recorder tapes, interviews, direct observation of aviation personnel activities and simulations. Secondary sources include aviation occurrence data bases, reference literature and human factors professionals and specialists.

- a) Primary sources
 - 1) Hardware evidence is most often associated with the aircraft but may also involve other work stations and equipment used by aviation personnel (e.g., air traffic controllers, flight attendants, aircraft maintenance and servicing personnel). Specific sources include aircraft wreckage, similarly configured aircraft, manufacturer's data, company records



and logs, maintenance and servicing equipment, air traffic control facilities and equipment, etc.

- 2) Paper documentation spans the complete spectrum of SHELL interfaces. Consider the following list of documents:

Personal records and logbooks; Certificates and licences;

Company personnel and training records; Aircraft flight manuals;

Company manuals and standard operating procedures;

Training Procedure Manuals and syllabi;

Company training and operational schedules;

Regulatory authority records;

Weather forecasts, records, and briefing material;

Flight planning documents;

Medical records; and

Medical and post-mortem examinations.

- 3) Flight data recordings and ATC radar tapes are valuable sources of information for determining the sequence of events and examining the liveware-liveware interfaces. Within airlines using flight recorder monitoring programs, there can be a wealth of information about crew's normal operating procedures. In addition to traditional flight data recordings, new generation aircraft have maintenance recorders and some electronic components with non-volatile memories that are also potential sources of information. Audio (ATC and CVR) recordings are invaluable sources of information about the liveware-liveware and liveware-hardware interfaces. In addition to preserving personnel communications, audio recordings can also provide evidence on the state of mind of individuals, and possible stress or fatigue. It is essential, therefore, that persons familiar with the crew listen to the recordings to confirm the identity of the speaker and to indicate any anomalies in speech pattern or style. It is also essential that individuals knowledgeable about the specific crew operating procedures listen to the recordings to provide a more complete picture of crew activities that are non-verbal.
- 4) Interviews conducted with individuals both directly and indirectly involved in the occurrence are also important.

Consider the following persons to interview:

- Flight crew
- Other crew members



- Air traffic controllers
- Flight attendants
- Passengers
- Eyewitnesses
- Ground handlers
- Weather briefers
- De-icing personnel
- Dispatchers
- Baggage handlers
- Aircraft maintenance engineers
- Company owner
- Chief pilot
- Instructors
- Other company pilots
- Supervisors
- V.P. flight operations
- Chief instructor
- Check pilot
- Former employers
- Chief of maintenance
- Technical specialists
- Maintenance engineers
- Flight test examiners
- Auditors
- Airworthiness inspectors
- Other regulatory authorities
- Physician
- Aeromedical examiner
- Psychologist
- Co-workers
- Friends
- Family members

Knowledge gleaned from such interviews can be used to confirm, clarify, or supplement data from other sources. In the absence of measurable data, interviews become the single source of information, and investigators therefore need to be skilled on interview techniques. Guidelines on interview techniques are contained in Appendix 2 of ICAO Human Factors Digest No. 7 (Cir 240), Investigation of Human Factors in Accidents and Incidents.

b) Secondary sources

- 1) Not all human factors factual information is gathered in the field. After the field phase of the investigation, additional information about human factors may be collected, facilitating analysis of the factual information collected in the field. These secondary data come from several sources.



- 2) Direct observations of actions performed in the real environment can reveal important information about human factors. Observations can be made of the following:

- Flight operations activities
- Flight training activities
- Maintenance activities
- Air Traffic Control activities

- 3) Simulations permit reconstruction of the occurrence and can facilitate a better understanding of the sequence of events which led up to it, and of the context within which involved personnel perceived the events.
- 4) Computer simulation can be used to reconstruct events by using data from the flight recorders, air traffic control tapes, and other physical evidence.
- 5) Often a session in an aircraft flight simulator or reconstruction of a flight in a similar aircraft can offer valuable insights into the circumstances that led to an occurrence. Participation in simulations by personnel involved in the occurrence events can trigger recollection of important information which would otherwise not come to light.
- 6) Aviation safety databases containing accident/incident data or confidential reporting systems and databases maintained by some aircraft manufacturers are useful sources of information directly related to the aviation operational environment. Examples are ADREP (ICAO), STEADS (IATA), CASRP (Canada), ASRS, and ASIS (United States), CAIRS (Australia), CHIRP (United Kingdom).
- 7) Investigators should use databases with caution, however, being sure to know its source and target populations as well as its limitations. They should be familiar with the vocabulary used in a specific database, as no single set of key words is common to all databases. Coding and data entry criteria differ between various databases, which may affect the meaning of retrieved data. Appendix 4 of ICAO Human Factors Digest No. 7 (Cir 240), Investigation of Human Factors in Accidents and Incidents provides a more detailed discussion of databases and their application to the investigation of human factors.
- 8) Literature reviews can be an important source of information. Consulting reference material can help to do the following:
 - i) Identify how a given human factor may affect performance;
 - ii) Relate the information found in the field to what is known of human behaviour in similar circumstances; and
 - iii) Organize the information gathered in the field in a logical way.
- 9) It should be noted that basic psychological and sociological references can be good sources of information about general human performance, but they seldom address human behaviour in conditions comparable to the aviation operational environment. In recent years, professionals in the human factors field have provided some valuable material addressing aviation operational issues. Some aviation research agencies will, on request, provide literature review



services on selected topics. Additional references can be found in ICAO Human Factors Digest No. 7 (Circular 240).

- 10) At any time during an investigation, investigators must be willing to consult professionals outside their area of expertise. These professionals include, but are not restricted to, the following:
 - i) Medical officers — to analyze the impact of any medical condition found in the flight crew or other relevant personnel;
 - ii) Psychologists — to analyze the impact of environmental, operational, and situational factors on motivation and behaviour;
 - iii) Sociologists — to evaluate the factors that affect interactions and performance;
 - iv) Sleep researchers and professionals — to evaluate the quality of rest available to the individual, and the impact on performance of a particular work-rest duty cycle or of circadian factors; and
 - v) Ergonomists — to assess the effect of design and layout on the user.

Data gathering guidelines

8.2.5.3.3.4 The following data gathering guidelines on the gathering of Human Performance information are based on the SHELL and LUC frameworks. These guidelines were designed to offer:

- a) some suggestions on how performance can be altered by these factors; and
- b) some guidance on areas to examine for sources of evidence.

8.2.5.3.3.5 In addition to the guide above, refer to the Bureau’s Human Factor Investigation Checklist for the SHELL Model components and interfaces to help investigators collect data to achieve a thorough human factors investigation.

8.3 PROGRESS MEETINGS

8.3.1 The investigation management system incorporates the use of a daily progress meeting of the investigation team. The primary purpose of progress meetings is for all team members to participate in the daily reports of the various groups and for all team members to be aware of findings of other groups and to plan future activities. It also builds the “team concept”, which is essential for a major accident investigation to be successful. Further, the progress meetings provide the IIC the opportunity to oversee the progress and findings of the investigation and to provide leadership and guidance as necessary.

Note.— Progress meetings should be held whether the number of investigation team members is small (3 to 5 persons) and may be held in an informal setting, such as in a vehicle at the accident site, or similar location. Large progress meetings (10 to 100 persons) should be held in a more formal setting, such as a large room at a hotel or similar location. Holding such meetings is part of the investigation management system.



- 8.3.2 The typical format of the progress meeting would be for the IIC to make a general opening statement and to bring the team up to date on developments outside of the team, such as review of maintenance records, reports from flight recorder read-outs, and other investigation activities being conducted away from the accident site. If new Investigator s join the team, they will be given the rules, policies, and procedures and assigned to the appropriate group.
- 8.3.3 Then the IIC should request that each group chairperson give a brief report. The format of group chairperson reports should be:
- a) What we did today.
 - b) What we found today.
 - c) What we plan to do tomorrow.
 - d) Any questions, comments, or suggestions.
- 8.3.4 Group reports should be short and concise. Relevant documents, such as weather reports or similar data, should be distributed to other participants and do not have to be read at the progress meeting. Reports and questions should be restricted to factual information. This is not the place to begin to speculate or analyse the causes of the accident. If the progress meeting is organized and managed properly, it should not take more than one hour.

Note.— When participants have different first languages, the use of interpreters is essential for all persons to gain the full benefit of the progress meeting reports, so they can understand the information to pass on to their superiors and to develop accident prevention measures. In some cases, it would be appropriate for the group chairpersons to provide advance hard copies of their briefing notes for participants to follow during those oral briefings.

- 8.3.5 Following the progress meeting, the IIC should report findings and progress to his/her superiors and should prepare for possible media and family briefings.

8.4 COOPERATION WITH THE MEDIA

- 8.4.1 All major aircraft accidents and most small accidents generate a high degree of interest from the public and the media. A good rapport with the media is usually an asset to the investigation. It may be necessary to enlist the cooperation of the local media to withhold precise details of the location of an aircraft accident until adequate crowd-control measures can be implemented. It may also be necessary to enlist the aid of the media in obtaining further information about the local area, the names of possible witnesses or when seeking the public’s assistance in recovering missing pieces of the aircraft wreckage.
- 8.4.2 To promote dissemination of factual information and to minimize speculation and rumours about the accident, the Bureau will provide the media, on a regular basis, with details of the progress of the investigation and facts that can be released without prejudice to the investigation. For this reason, the IIC and the Bureau will establish a single point of contact for media inquiries. This contact is usually the Commissioner or a person designated by the Commissioner. The Bureau, in consultation with the Accredited Representatives, should provide non-prejudicial facts and circumstances to the media.



Nevertheless, it is necessary to ensure that the needs of the media do not interfere with the proper conduct of the investigation. The media should be informed that a preliminary (factual) report will be released about 30 days after the accident.

- 8.4.3 Other agencies and organizations involved or affected by the accident (such as airlines, airport authorities, emergency services, and aircraft manufacturers) may also need to release information to the media about their involvement, and such efforts should be coordinated, to the extent possible, among the agencies and organizations involved. Nonetheless, the Bureau is the primary point of contact and the only organization permitted to release information on the progress and findings of the investigation.
- 8.4.4 For accident investigations outside the country and conducted by other States, the Bureau-appointed Accredited Representative and his/her advisers participating in the investigation shall not give the media or the public access to any information or documents obtained during the investigation without the express consent of the State conducting the investigation. The release of such information by the Bureau or other Sierra Leonean officials, without the consent of the State conducting the investigation, would undermine the mutual confidence and cooperation among the States involved and must therefore be avoided.

8.5 DEALING WITH FAMILIES OF ACCIDENT VICTIMS

8.5.1 General Provisions

- 8.5.1.1 ICAO Policy on Assistance to Aircraft Accident Victims and their Families (Doc 9998), the Manual on Assistance to Aircraft Accident Victims and their Families (Doc 9973) contain internationally accepted guidance and practices for States to follow when dealing with aircraft accident victims and their families and ICAO Circular 285 Guidance on Assistance to Aircraft Accident Victims and their Families contains internationally accepted guidance and practices for States to follow when dealing with aircraft accident victims and their families.
- 8.5.1.2 Section 76 of the Civil Aviation Act has established two government bodies responsible for the development, preparation, and coordination of the implementation of the family assistance plan to provide support to the aircraft accident victims and their families. The National Disaster Management Agency (NDMA) shall coordinate with the Authority and the Bureau the necessary assistance to aircraft accident victims and their families with air operators, airport operators and any other interested third party. And the National Platform chaired by the Vice President of the country ensures the availability required resources to support the efforts of the airline operator whose aircraft is involved in the accident to provide timely assistance to the aircraft accident victims and their families.
- 8.5.1.3 Victims and their families are not permitted to participate in the investigation; however, the SLCAR Part 13, chapter 5, section 5.27, “Participation of States having suffered fatalities or serious injuries to its citizens”, provides certain rights and entitlements to States, which have a special interest in an accident by virtue of fatalities or serious injuries to its citizens. Specifically, such States, upon making a request to do so, are permitted to appoint an “expert”, who shall be entitled to:
 - a) visit the scene of an accident;
 - b) have access to the relevant factual information, which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
 - c) receive a copy of the Final Report.



8.5.1.4 This should not preclude the State from also assisting in the identification of victims and in meeting with survivors from that State.

8.5.1.5 These provisions do not permit the appointed expert to actively participate in the investigation.

Note — For accidents that occur outside country that involve Sierra Leonean citizens, it may be necessary for Sierra Leone to send experts to assist the other State with the identification of victims. This task is not directly related to accident investigation and does not fall under the mandate of the Bureau. Although the Bureau may not be required to provide an expert(s) for this task, the Bureau should encourage the relevant Sierra Leone’s foreign affairs authorities and personnel to provide such assistance, normally through the Sierra Leonean Embassy in the other State.

8.5.1.6 ICAO Annex 9 Facilitation, Chapter 8, Section I Assistance to aircraft accident victims and their families, contains SARPs related to States’ obligations to facilitate entry into their territory, on a temporary basis, of family members of victims of aircraft accidents. Sierra Leone will extend all necessary assistance, such as issuing emergency travel documents, arranging transport, and clearing customs for families of aircraft accident victims.

8.5.1.7 The general responsibilities for dealing with the families and aircraft accident victims lie with the airline (operator), which should have in place a plan for dealing with families and victims of aircraft accidents. However, the Bureau will provide oversight of such activities. Therefore, the Bureau will establish liaison with relevant family members, or their representatives, to facilitate the provision of briefings on the investigation findings and the progress of the investigation, release of human remains, release of personal effects held as part of the investigation to the families and the accident so far as it is practicable, and to facilitate the necessary access for other States’ experts, in accordance with the provisions of SLCAR Part 13, chapter 5, section 5.27 and ICAO Manual on Assistance to Aircraft Accident Victims and their Families (Doc 9973). The SL-AAIIB and the NDMA will coordinate with the SLCAA, SLAA, Security Forces, State of Registry, State of Operator and all other relevant Ministries, Departments and Agencies to facilitate the family assistance plans. It is the responsibility of the SLCAA to ensure that the airline operators and Freetown International Airport review their family assistance plans periodically. And also, to ensure that the airline operators make arrangement with the airport to implement family assistance plans.

8.5.2 Provision of Information to Victims and Families

8.5.2.1 Upon receipt of the notification of an accident, the Commissioner will immediately contact the Director of Flight Safety Standards of the SLCAA either in person or by phone, to request all the necessary contact information of the operator, including the contact information of the person in charge of the operator’s family assistance plan.

8.5.2.2 The Commissioner will contact the operator by the quickest means available to request the relevant information on all persons on board as soon as practicable from the date of receipt of the notification. The person in charge of the operator’s family assistance plan shall provide to the Commissioner relevant contact information of victims and their families.

8.5.2.3 The Commissioner will determine the channel to be used for the first interaction with victims and families within 2 working days after the accident.

Note: When the first interaction takes place through a face-to-face meeting, close coordination must



be maintained with the operator (especially in relation to logistical issues), IIC and with the Director of Flight Safety Standards of the SLCAA.

8.5.2.4 The Commissioner will conduct the first interaction with the victims and their families either by:

a) Face-to-face meeting to be conducted within the first 15 days after the accident.

Note 1: Unless there is a special request from the victims and / or their families, or a request from the operator with the consent of the victims and their families, all face-to-face meetings will take place at the determined by the Commissioner.

Note 2: After a face-to-face meeting, a documentary record must be made to be filed at the time of the investigation and which shall contain, at least: the date, time and place of the meeting, the list of presence of the victims and family, and an extract from the information disclosed at the event.

b) Bureau's Website: Within 20 working days after the accident, being all victims and families previously informed of the date of the publication, either by e-mail or by phone.

Note: All information to be released for victims and families shall be sent to the Head of ICT by email, with copy to the IIC, at least 3 working days in advance of the publication date.

8.5.2.5 The Commissioner will determine, within 10 working days after the first interaction, the channel to be used for the subsequent interactions, by assessing:

- a) the pace of the investigation
- b) the availability of the Commissioner
- c) the availability of victims and families, and
- d) the effectiveness of each of the authorized channels

8.5.2.6 Subsequent interactions will be conducted by the Commissioner in accordance with the selected channel, each one observing the following criteria:

a) Face-to-face meetings - To be conducted in periods of not less than 90 days from the previous meeting.

b) Bureau's Website: to be published within 10 working days after the appearance of relevant information, and every 2 months if no relevant information appears, being all victims and families previously informed of the date of the publication, either by email or by phone.

c) Telephone: within 5 working days after the appearance of relevant information.

Note: All interactions made by telephone shall be registered and maintained in the electronic folder of the investigation.

d) E-mail: within 5 working days after the appearance of relevant information, through a standardized message to ensure that each recipient receives the same information.

Note: All interactions made by e-mail shall be archived in the electronic folder of the investigation.



8.5.2.7 The Commissioner will decide on any special requests for interaction (for example, unplanned interaction, use of a channel other than the established one, meeting in a location other than the place determined by the Commissioner, etc.) of victims and families, the operator or other sources within 10 working days after receiving the formal request.

Note: The decision shall be made considering, among other aspects, the pace of the investigation, the availability of the Commissioner, the availability of victims and families, the impact of the accident in the media, the available budget, and the logistical support from the operator.

8.6 SECURING THE RECORDS, SAMPLES AND RECORDINGS

The Bureau's procedures require that, the IIC should make arrangements with appropriate entities to ensure that in the event of an accident, flight recorders, all recording devices found on board belonging to the crew or passengers, all air traffic services communication and data recordings and documents deemed to be associated with the flight, and aviation meteorology data, be secured and placed in protective custody. The Bureau has agreements (MoUs) with the relevant organizations (Police, Roberts Flight Information Region (RFIR)) and Sierra Leone Meteorological Agency (SLMET) to fulfill this requirement (Refer to Appendix C to this manual). Further instructions are in place, which require that the aircraft operator's documentation associated with the aircraft, the flight crew and the flight operation is placed in safekeeping by the IIC.

8.7 REMOVAL OF THE AIRCRAFT WRECKAGE

Detailed information concerning planning, equipment and procedures for the removal of disabled aircraft at airports is contained in the Airport Services Manual (Doc 9137), Part 5 Removal of Disabled Aircraft.

8.8 RELEASE OF THE AIRCRAFT WRECKAGE

8.8.1 The aircraft wreckage should remain under the custody of the Bureau until such time as it should be released back to the owner of the aircraft, or the owner's representative (insurance company). In many cases, the aircraft wreckage should be released in increments, depending on the needs of the Investigators for testing of selected components.

8.8.2 For accidents in Sierra Leone involving aircraft registered and operated by other States, the Bureau will facilitate the release from custody of the aircraft, its contents, or parts thereof, as soon as they are not required for the investigation, to person(s) duly designated by the State of Registry or State of the Operator. This provision is particularly important when occurrences involve minimal damage to an aircraft that needs to be repaired and returned to service.

8.8.3 Portions of the aircraft wreckage may be released, or the entire aircraft wreckage may be released, using the aircraft wreckage and parts release form (see Appendix F) that includes the name and organizational information of the IIC and the owner of the aircraft or the owner's authorized representative. The release form should include the identifying information on the accident and the aircraft.

8.8.4 If the entire aircraft wreckage is to be released, the IIC should sign the aircraft wreckage and parts release form and he/she should obtain a signature from the owner of the aircraft, or owner's representative, who accepts the aircraft wreckage. If only portions of the aircraft wreckage are being released, the aircraft wreckage and parts release form should list the components being released and any components being



retained for further examination, along with the appropriate signatures verifying the release and retention of parts. Each time a portion of the aircraft wreckage is released, an additional aircraft wreckage and parts release form should be completed to document the transfer.

Note — The Bureau will obtain full concurrence with all parties, including police involved in the investigation, about the decision to release aircraft wreckage before it is turned over to the owner of the aircraft or the owner’s representative. The IIC or any assigned officer of the Bureau should coordinate his/her decision with the Commissioner or any officer designated by the Commissioner.

8.9 CO-ORDINATION WITH EXTERNAL RESOURCE PERSONNEL AND FACILITIES

8.9.1 The Bureau typically extends participation to those individuals and organizations that can provide the necessary technical assistance to the investigation. Such may include the aircraft Operator, Civil Aviation Authority, Airports Authority, approved hospitals, Military, Police, International Red Cross etc.

To facilitate this, the Bureau uses the instrumentality of agreements or MoUs as the arrangement in place prior to the accidents.

8.9.2 The personnel from these organizations are co-opted on part time basis when the need arises in the investigation of an accident. The personnel from the Operator usually serve as ‘Technical Observers’ in the investigation. Requests for the personnel to be co-opted are made through letters to the relevant organizations. Such organizations should ensure that these personnel are relieved of their regular duties. Personnel co-opted from these organizations will be responsible to the IIC to avoid any possible conflict of interest during the investigation.

8.9.3 The Civil Aviation Authority cooperates with the Bureau’s investigation and takes immediate regulatory action as necessary to prevent a recurrence.

8.9.4 The Airports Authority/National Fire Force (NFF) in conjunction with other medical institutions/facilities usually provides expeditious assistance in the areas of rescue/firefighting, medical personnel, mortuaries and wreckage storage. Also autopsy of examination of flight crew and where the need arises, of fatally injured passengers and cabin attendant is usually carried out by pathologists preferably experienced in accident investigation.

8.9.5 Furthermore, when appropriate, medical examinations of the crew, passengers and involved aviation personnel are conducted by physicians, experienced in accident investigation. The autopsy and medical examinations conducted are usually expeditious and complete. Police, National Fire Force (NFF), National Disaster Management Agency (NDMA), Military Personnel, Red Cross and other Agencies also provide assistance at the scene but are not made parties to the investigation. The Bureau may from time to time enter into Memoranda of Understandings (MOU) with these agencies.

8.10 TECHNICAL EXPERTISE FROM FOREIGN PARTNERS

8.10.1 In carrying out an investigation, the Bureau may source for technical expertise from where they are available when such expertise is lacking in the Bureau. In order to achieve this, the Bureau may from time to time enter into Memoranda of Understandings (MOU) with other accident investigation authorities.



8.10.2 Requests for such assistance are normally sent by the quickest means possible usually through electronic means. These foreign investigative bodies are willing to offer the Bureau their technical expertise when the need arises. The Accredited Representatives from such countries may also be accompanied by their advisers (engines and aircraft manufacturers).



CHAPTER 9 - TESTS AND COMPONENT EXAMINATIONS

9.1 LABORATORY TESTING OF AIRCRAFT SYSTEMS AND COMPONENTS

- 9.1.1 In many cases, specialist examinations or testing of specific components will be required. The Bureau depends on facilities and expertise of other States' investigation authorities for testing and analysis of aircraft components. The same policies and procedures for tests and component examinations as used for the accident site phase of the investigation will be followed. This chapter Bureau's Policy and Materials and the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part I, paragraph 5.7 includes guidance on planning specialists' off-site examinations of components.
- 9.1.2 Specialist examinations may range from a scanning electron microscope (SEM) examination of a failed part to chemical analysis, and/or aircraft systems testing or flight testing. Laboratory examination and testing generally entail the use of specialized equipment not available at the accident site and are often beyond the capability of an aircraft maintenance facility. The Bureau may give consideration to using the component manufacturer's facilities where specialized equipment and trained personnel are readily available. However, this should require close supervision by the Bureau's Investigators, or by Investigators designated by the Bureau to ensure that there is no real or perceived conflict of interest. All activities, particularly disassembly and testing phases, should be documented and photographed for evidence purposes.
- 9.1.3 Specialist examinations may also be needed to conduct the read-out and decoding of information from other electronic devices, such as satellite navigation equipment (e.g., GPS, GLONASS, GPWS, TAWS, FMS, etc.).
- 9.1.4 Laboratory testing should not be limited to standard tests. In addition to testing for compliance with appropriate specifications, it may sometimes be necessary to determine the actual properties of the specimen (such as metal, material, fuel and oil). Occasionally, it is necessary to devise special tests that fully exploit the components capabilities. A wide range of specialized testing equipment permit simulation of a variety of malfunctions.
- 9.1.5 When Investigators send failed parts or components for laboratory testing, they should provide as much information as possible relative to the circumstances contributing to the failure of such parts or components, including their own hypotheses/suspicions. The information provided by the Investigator is intended only as a guideline to the specialist who should, nevertheless, explore all relevant aspects. It is not sufficient for a Investigator to send parts for specialist examination with the innocuous instructions "for testing".
- 9.1.6 The Investigator should provide a detailed history of the part or component, covering such items as:
- a) the date it was installed on the aircraft;
 - b) the total number of service hours;
 - c) the total number of hours since the last overhaul or inspection;
 - d) previous difficulties reported; and



- e) any other pertinent data that might shed light on how and why the part or component failed.

Note — If not accompanied by a Bureau’s Investigator, arrangements should be made for supervision by an Investigator from the State where the testing is to take place, or an Investigator from another State, or properly designated independent person.

- 9.1.7 In order to preserve evidence, it is essential that failed parts and components requiring specialist examination be extracted from the wreckage with care. Consultations with experts from the aircraft manufacturers and airlines should be held to ensure proper decisions. Aircraft systems, whether mechanical, electrical, hydraulic or pneumatic, will be removed in sections as large as practicable. Relevant sections should preferably be dismantled rather than cut off. Paint smears, which are often extremely important in collision accidents and in-flight failures, require protection. This also applies to smoke or soot smears.

9.2 PRACTICAL ARRANGEMENTS

- 9.2.1 The nature of the specialist examinations and the type of components and systems to be tested should determine the facility to be chosen. The Investigator must be confident that the facility chosen is capable of providing the required examination and testing. Prior arrangements should be made with the facility as far in advance as practicable so that the management of the facility can plan the tests and assign personnel and equipment.
- 9.2.2 When choosing a system and components for specialist examination and testing, it is desirable to include as many components of the system as practicable, e.g., wiring harnesses, relays, control valves and regulators. Tests conducted on a single component should reveal information about the operation of that particular unit only, whereas the problem may actually have been in one of the related components. The most valid test results should be obtained by using as many of the original system components as possible.
- 9.2.3 Each component should be tagged with its name, part number, serial number and the accident identifier. The Investigator should maintain a listing, descriptive notes and photographs of all components, which are to be tested; the components themselves should be kept in protective storage until ready for shipping.
- 9.2.4 Components should be packed to minimize damage during transport. Particular care should be taken to ensure that fracture surfaces are protected by appropriate packing material so that surfaces coming into contact with each other or with other parts do not suffer any damage.
- 9.2.5 Whenever possible, power plants should be shipped in their special stands and containers. Other heavy components, such as flight control power units, stabilizer screw jack assemblies and actuators, should be packed in protective wrapping and placed in separate wooden containers. Blocks or bracing should be installed inside the containers to prevent any movement of the component during transport.
- 9.2.6 Smaller and lighter components should be shipped in the same manner with more than one to a box, but in a way which should prevent them from coming into contact with one another. Very light units should be packed in heavy corrugated pasteboard cartons with packing material sufficient to prevent damage from mishandling during transport. The Investigator s should label all boxes and cartons appropriately and should make an inventory list for each container.



- 9.2.7 Occasionally, it may be necessary to send a part, or parts, of a damaged aircraft to another State for technical examination or testing. In accordance with ICAO Annex 9 Facilitation, Chapter 8, Section B, each State concerned shall ensure that the movement of such part, or parts, is effected without delay. The States concerned shall likewise facilitate the return of such part, or parts, to the State conducting the investigation.

9.3 NOTES AND TEST RESULTS

- 9.3.1 Prior to conducting the examinations and tests, the Investigator(s) and the facility personnel involved should be briefed on the type and extent of the tests to be carried out and should review the test procedures to ensure their adequacy. Basically, a written test plan should be prepared and agreed to by all participants before proceeding with any testing. The test plan becomes a written record of the planning and conduct of the component investigation.

Note — A good technique for developing a test plan is to ask the manufacturer of the component to prepare a draft test plan protocol, which should then be reviewed and agreed upon by all participants in the examination. However, the final decision on the test plan rests with the Bureau.

- 9.3.2 Any discrepancies found during testing should be photographed and documented with an explanation as to their bearing on the operation of the system or component. It should be kept in mind that the tolerances called for in the test procedures may only apply to new or overhauled components and that components which have been in service for some time may have acceptable limits outside these tolerances. If the nature of the discrepancy so warrants, a component should be disassembled following completion of the tests to ascertain the cause of failure. Photographs should be taken of the parts prior to and during disassembly, and the findings should be documented in writing.
- 9.3.3 Consideration should be given to X-raying components before disassembly if the position of springs, contacts, etc., could be lost during the disassembly.
- 9.3.4 Off-scene tests and examinations should be completed under the same rules and procedures for the on-scene phase, which excludes non-technical personnel. However, in some cases, other personnel, not part of the investigation team, may be ordered to participate or observe by a judicial authority. In such cases, Investigator s must ensure that they do not discuss their opinions, or make comments on any findings or analyses in the presence of these non-technical third parties.
- 9.3.5 If insurance loss assessors or other parties, who are not part of the investigation team, have been approved to attend and observe the disassembly, the Investigator and test facility personnel must take extreme care. Findings and analyses should not be discussed in the presence of non-investigation personnel, because they may use such information inappropriately.
- 9.3.6 Following completion of the testing, the Investigator (s) and facility personnel should review and discuss the results. When there is agreement that the data gathered present a true and factual picture of the condition and capabilities of the components, the notes and test results should be reproduced into field notes to serve as a record of the examination and testing of the system or component.



REPORTING



CHAPTER 10 - WRITING FINAL REPORT AND MAKING SAFETY RECOMMENDATIONS

10.1 GENERAL

- 10.1.2 The Bureau will issue a Final Report for all investigations. The format and content of the Final Report should be in accordance with guidance contained in the Appendix 1 to ICAO Annex 13 and in the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part IV Reporting. The circumstances of an occurrence and the safety issues involved should determine the size and scope of the Final Report. For all occurrences involving aircraft registered, operated, designed, or manufactured outside Sierra Leone, full adherence to the ICAO format should be maintained. In accordance with ICAO Annex 13, the report should be clear and concise.
- 10.1.2 It is the policy of the Bureau to complete and to make the Final Report publicly available as soon as possible. The Final Report will be made public by posting it on the Bureau’s internet website, as well as by sending a hard copy to all States involved and ICAO, as per Annex 13 provisions.
- 10.1.3 After the completion of the field phase of the investigation, the Investigator-in-charge (IIC) should develop a report completion schedule that includes target dates for completion of the Final Report. Target dates should be consistent with the complexity of the safety issues involved in the occurrence.
- 10.1.4 The general target date for completion of “small” occurrence investigations with minimal safety issues is not more than six months from the date of the occurrence. The target date for completion of major occurrences with complex safety issues is usually twelve months, or as soon as possible.
- 10.1.5 If for some reason the Final Report cannot be made publicly available within twelve months, the Bureau will make an interim statement publicly available on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised. The Bureau may also issue interim reports and/or safety recommendations, at any time deemed necessary to highlight any safety issues that may be of interest to other States and/or organizations.

10.2 GROUP REPORTS

10.2.1 Field notes

Each investigation group completes “Field notes” during the field phase of the investigation and for all component examinations and test work. Field notes should be completed in the same format as factual reports (see 10.2.2 below). Upon completion of the field notes, each member of the group should sign them signifying their agreement with the content, accuracy, and completeness. If any of the group members did not take part in some portion of the fact-finding, this aspect should be noted under his/her signature. Similarly, if differences cannot be resolved between a group member and the group chairperson, the substance of the disagreement should be stated in the field notes under the signature.

10.2.2 Factual reports

- 10.2.2.1 Factual reports are derived from the field notes and enhanced with follow-up investigation work.



10.2.2.2 In consultation with the group members, the group chairperson is responsible for scrutinizing the evidence gathered in relation to the tasks assigned to the group, and for drafting a group report, which presents all the facts relevant to the activities of the group. The group factual report may also include attachments to the report (e.g. maps, charts, or other documents) that support the written record of the investigation. Referred to as the “group factual report”, the draft should be shared with other specialists who participated in this phase of the investigation, as well as Accredited Representatives and their advisers participating in the investigation. This consultation is for the purpose of ensuring completeness and accuracy, hereafter referred to as the “technical review” (see 10.3 below). After consultation and revision of the group factual reports, copies should be provided to all organizations and specialists that participated in the investigation.

A group factual report should be presented in the following format:

Flight Operations Group Factual Report (or Field Notes) / (date)
A. Accident: XXXX (identifying code number assigned by Accident Investigation Bureau) Location: XXXX [city, State, country] Date/Time: XXXX Aircraft: XXXX [make, model, registration]
B. Group members XXXX Group chairperson XXXX Airline specialist XXXX [CAA] specialist XXXX Manufacturer specialist
C. Summary This section should provide a synopsis of the occurrence, such as flight number, take-off time, accident time (if known), number of persons on board, injuries, etc. This section also should contain a brief synopsis of the scope of the group’s work. The terms of reference for the group and subgroups and brief details of the time and location of investigation activities should also be recorded in this section. For example, “the Flight Operations Group interviewed the pilots, reviewed records, and conducted simulator work” and, “the Aircraft Systems Group documented the aircraft components on-scene, removed some parts, and conducted component examinations at the facilities of the manufacturer”.
D. Details of Investigation The facts, conditions and circumstances established by the group and investigation findings (factual) should be presented under appropriate headings describing the areas investigated. For example, in the case of the Flight Operations Group, headings would include crew histories, flight planning, dispatch and aircraft mass and balance. All the relevant facts, whether or not considered significant to the findings of the group, should be included. Relevant documentation should be attached to the group report.

10.3 REVIEW MEETINGS

10.3.1 Technical Review

10.3.1.1 Once the investigation is complete and all group reports and other factual data are available, the Commissioner or any officer designated by the Commissioner should convene a technical review meeting at which all of the factual materials collected during the investigation should be reviewed one last time, before the writing of the Final Report is initiated. Accredited Representatives and their advisers, and other parties that participated in the investigation have one more opportunity to ensure that the factual record of



the investigation is complete, objective, and accurate. The IIC should attempt to achieve full concurrence with all of the factual material before moving to the Final Report writing phase.

- 10.3.1.2 In some smaller accident cases, the technical review meetings could be held by conference call or by email and correspondence. However, for major airline accidents with complex safety issues, a full technical review meeting should be convened.
- 10.3.1.3 At the completion of the technical review, if full concurrence about the factual data collected cannot be reached, the investigation may need to be re-opened to resolve disagreements. Any unresolved differences should be noted in the factual record of the investigation.

10.3.2 Investigation Planning Meeting

- 10.3.2.1 Subsequent to the field phase, significant investigation work remains, and the Investigator-in-charge must work diligently to maintain and manage the progress of the investigation. In general, the post-field phase involves:
 - a) the continued collection and validation of evidence;
 - b) the examination of all pertinent personnel, company, government, aircraft, facility, and other records;
 - c) the examination of selected wreckage in the laboratory;
 - d) the testing of selected components and systems;
 - e) the reading and analysis of recordings; the conduct of further interviews; the determination of the sequence of events;
 - f) the analysis of all investigation information; and completion of technical and group reports, if any.
- 10.3.2.2 The post-field phase can take many months, depending on the size and complexity of the investigation.
- 10.3.2.3 It is always a challenge to ensure that the investigation continues to progress following the field phase, for the most part because the members of the investigation team are no longer centrally located, and subject matter expertise is no longer readily available. As a result, the group chairpersons and the Investigator-in-charge will have to increase their efforts to maintain communication with team members and to ensure that investigation tasks are completed on time.
- 10.3.2.4 In this regard, the Investigator-in-charge should have frequent, regularly scheduled, decision-oriented team meetings, and have additional meetings for significant issues or for issues that will require a change to the investigation plan.
- 10.3.2.5 Specifically, it is prudent for the Investigator-in-charge to convene an investigation planning meeting soon after the team returns from the accident scene. The meeting should be attended by the group chairmen and senior management and should provide for a discussion of the scope of the investigation, the primary issue areas, and the scheduling of future investigative tasks. All team members should understand that they do not have to wait for a meeting to communicate significant, new information.



10.3.2.6 Thus, investigation planning meeting should develop investigation project with timelines on Excel Spread Sheet covering all activities months from date of occurrence to publishing the Final Report. This should be communicated to management and all investigation team members.

Note - To ensure the continued progress of the investigation, the Investigator-in-charge should ensure that all team members regularly refer to the Investigations Management System Event Checklist.

10.3.3 Management Review

10.3.3.1 Initial Management Meeting

10.3.3.1.1 In the first week after occurrence, the Commissioner should hold initial meeting with all investigation team for brainstorming on investigation activities (and alternatives with pros and cons), evaluation of activities and making decisions.

10.3.3.1.2 The meeting should focus on:

- a) purpose of the investigation;
- b) possible findings;
- c) cost estimates in terms of man-hour and finance required;
- d) whether to transfer the investigation of the occurrence to SLCAA; and
- e) decide on investigation plan - WHO, HOW, WHERE, WHEN will it be ready/ finalized with timeframe and milestones

10.3.3.2 Management Monthly Follow-up Review

The Commissioner should schedule a monthly follow-up meeting with all IICs of open/ active investigations to brief management on the following:

- a) oral as well as short written progress report on all on-going investigations
- b) review accuracy of planned investigation time frame
- c) identify needs for more or other resources
- d) take measures to get a delayed/lagging investigation back on track
- e) allocate more resources

10.3.3.3 Investigation Quality Follow-up



10.3.3.3.1 Three (3) months after publishing the Final report, there should be a quality review of the investigation process and layout of the final report vis-a-vis findings, causes and safety recommendations.

10.3.3.3.2 The investigation team and one (1) independent investigator should carry out the quality review. The review should ask the following questions:

- a) What was good and not so good?
- b) What should we have done differently?
- c) Was the allocated time frame reasonable?
- d) Was the cost reasonable?

10.3.3.4 Annual Bureau Quality Follow-up

The Bureau should conduct analysis of all investigation quality follow-ups to:

- a) Determine trends;
- b) Identify successful procedures;
- c) Identify common mistakes;
- d) Identify lessons learned;
- e) Review comments received from Accredited Representatives and advisers; and
- f) Identify need for changes to governing documents (PPM, Guidance Materials, etc.).

10.4 FORMAT OF THE FINAL REPORT

10.4.1 General

10.4.1.1 All the Bureau's accident and incident reports should contain the following reference to the objective of the investigation in the Introduction or Foreword:

In accordance with ICAO Annex 13, it is not the purpose of aircraft accident and incident investigation to apportion blame or liability. The sole objective of the investigation and the Final Report is the prevention of accidents and incidents. (Reference: ICAO Annex 13, Chapter 3, paragraph 3.1.)

10.4.1.2 Appendix 1 of ICAO Annex 13 contains the general format for the Final Report. Furthermore, detailed guidance regarding the format and content of the Final Report is contained in the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part IV - Reporting, Appendix 1 to Chapter 1. The ICAO format and guidance should be followed for most Final Reports. For some incidents and non-major accidents, the format of the report may differ, as all of the ICAO Annex 13 headings may not be applicable.



10.4.2 Chapters 1 and 2 of the Final Report

The Bureau will follow the ICAO format for Chapters 1 and 2 of the Final Report. Chapter 1 Factual Information should contain a comprehensive record of the facts, conditions, and circumstances established in the investigation. Chapter 2 Analysis should contain the significance of the relevant facts and circumstances that contributed to the accident or incident. This portion of the report should also contain the identification of safety deficiencies uncovered during the investigation, regardless of whether those deficiencies contributed to the accident. Supporting documents that are required to support the facts, analysis, conclusions, and recommendations should be included in appendices to the Final Report.

10.4.3 Chapter 3 of the Final Report — Conclusions

The Chapter 3 of the Final Report will include a list of findings, the Causal factors and Contributory factors, which should include both the immediate and the deeper systemic causes. The Bureau uses the guidance provided in the ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part IV Reporting, Appendix 1 to Chapter 1, Table 1-3 Example of causal statements, and Appendix 2 to Chapter 1 Report Writing Conventions, in the formation of its findings, causes and contributing factors. The Bureau will also include the following statement at the appropriate location in chapter 3: *The identification of causes does not imply assignment of fault or the determination of administrative, civil or criminal liability.*

10.4.4 Chapter 4 of the Final Report — Safety Recommendations

10.4.4.1 Chapter 4 of the Final Report is divided into two parts: “Safety Actions Taken” and “Safety Recommendations”. Safety actions taken may result from formal safety recommendations issued during the course of the investigation or as the result of corrective actions taken by the airline, manufacturer, Civil Aviation Authority (CAA), etc., without the issuance of formal safety recommendations.

10.4.4.2 The Bureau will include in Chapter 4 of the Final Report both safety recommendations made for the purpose of accident prevention, as well as any safety (corrective) actions taken during the course of the investigation. It will use the guidance provided in ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part IV Reporting, Chapter 1, when issuing safety recommendations during the course of the investigation and in its Final Reports. (See 10.8 for further details on safety recommendations).

10.4.5 Security and Access Control Measures for Draft Reports and Investigation Documents

10.4.5.1 The draft Report shall be drafted only on an investigator’s password enabled computer. The draft Report shall then be transferred to the Review computer which in the custody of the Manager of investigation division or any officer designated by them. Access to the computer shall be restricted and only a member of the investigation team who signs the appropriate register, shall have access to it for the review

Note 1. – All safety investigation reviews shall be carried out using the Bureau’s dedicated computers.

Note 2. – Draft Final Report shall have “Confidential” water mark inscribed.



- 10.4.5.2 Back up of all the reviews of accident/incident draft reports shall be kept in a hard drive with Manager of Investigation division. All Back up shall be retained in the archive for as long as there is space to keep even after the Final Report has been published and made public.
- 10.4.5.3 Access to the investigation review areas shall be restricted to authorized persons.
- 10.4.5.4 Upon receipt of draft report or any part thereof or any documents obtained during an investigation of an accident or incident, the Bureau shall not circulate, release or give unauthorized access to it, without the express consent of the State, which conducted the investigation, unless such report or documents have been published or released by the investigating authority.
- 10.4.5.5 The person issuing the draft Final Report or any documents obtained during investigation should brief the recipient on the need to maintain its confidentiality until the Final Report is made publicly available by the Bureau or authority conducting the investigation.
- 10.4.5.6 In addition, the Bureau's letter of transmittal of draft Final Report has the statement "This draft final report is confidential and should not be disclosed or shared to the public." as its watermark. Refer to Appendix E3 of this manual.

10.5 CONSULTATION

10.5.1 Consultation – Domestic Investigation

- 10.5.1.1 The Bureau follows the consultation provisions of ICAO Annex 13 to the Chicago Convention, Chapter 6, which are transposed in the SLCAR Part 13, chapter 6. It is the responsibility of the IIC to forward the confidential draft Final Report to all States that participated in the investigation in a transmittal letter using email, requesting their substantive and relevant comments within 60 days from receipt of the transmittal. The recipient States include:
 - a) the State that instituted the investigation;
 - b) the State of Registry;
 - c) the State of the Operator;
 - d) the State of Design;
 - e) the State of Manufacture; and
 - f) any State that participated in the investigation as per Annex 13, Chapter 5.
- 10.5.1.2 In order to obtain substantive technical consultation on the draft Final Report, the IIC will send, through the State of the Operator, a copy of the draft Final Report to the Operator to enable the operator to submit substantial comments. Similarly, the IIC will send, through the State of Design and the State of Manufacture, a copy of the draft Final Report to the organizations responsible for the type design and the final assembly of the aircraft to enable them to submit substantial comments.



- 10.5.1.3 The letter of transmittal for the draft Final Report will indicate that the State receiving the draft Final Report shall forward it to the airline operator, organizations responsible for design and assembly of the aircraft for their substantial comments (refer to Appendix E of this manual - Template Letters). It will also request each recipient to notify the Bureau of any interim safety actions taken, or safety actions under way, that can be included in the Final Report. The letter of transmittal should also state that comments should be received within sixty (60) days, unless a mutually agreed delay is granted.
- 10.5.1.4 The draft Final Report will also be forwarded to key parties in the investigation, such as Sierra Leone Civil Aviation Authority (SLCAA), the airport authority, airline concerned, etc. that participated or provided significant information in the investigation or a safety recommendation is addressed to, if necessary, in order to obtain their substantive and relevant comments. The same procedures for timing of receipt of comments and handling of the comments will be followed for the key parties within the country.
- Note —The Bureau’s intended safety recommendations are always included in chapter 4 of the draft final report.
- 10.5.1.5 The letter of transmittal for the draft Final Report should also request each recipient to notify the Bureau of any interim safety actions taken, or safety actions under way, that can be included in the Final Report. Comments should be received within sixty (60) days, unless a mutually agreed delay is granted.
- 10.5.1.6 Upon receipt of comments within 60 days of the date of the transmittal letter, the IIC in coordination with the manager of investigation division should conduct analysis of the comments received. Following the analysis of the comments received, the IIC should forward recommendation to the Commissioner on either to accept the comments or reject the comments. The Commissioner should either review or approve the recommendation by the IIC on the comments received.
- 10.5.1.7 If the comments received from any of the States are accepted, the IIC should amend the draft Final Report to include the substance of the comments received or, if desired by the State that provided comments, append the comments to the Final Report. Comments to be appended to the Final Report are restricted to non-editorial specific technical aspects of the Final Report upon which no agreement could be reached.
- 10.5.1.8 If the Commissioner does not agree with the comments, in part or in whole, then the IIC will append the comments from that State to the Final Report, unless that State elects not to have their comments appended.
- 10.5.1.9 If no comment is received within sixty days, the Commissioner shall issue the Final Report, unless an extension of that period has been agreed by the States concerned.

10.6 RECIPIENTS OF THE FINAL REPORT

In addition to the publication on its internet website, the Commissioner will forward with minimum delay a copy of the Final Report to:

- a) the State that instituted the investigation;
- b) the State of Registry;
- c) the State of the Operator;



- d) the State of Design;
- e) the State of Manufacture;
- f) any State that participated in the investigation;
- g) any State having suffered fatalities or serious injuries to its citizens;
- h) any State that provided relevant information, significant facilities or experts; and
- i) ICAO, where the accident or incident involves an aircraft of a maximum mass of over 5,700 kg.

10.7 DISTRIBUTION AND PUBLICATION OF FINAL REPORTS AND ISSUANCE OF INTERIM STATEMENT

10.7.1 Distribution and Publication of Final Reports

- 10.7.1.1 The Commissioner will cause the report of an investigation into an accident or incident, whose investigation was delegated to another State or a RAIO, to be made public in the shortest time possible (and, if possible, within 12 months of the date of the occurrence) and in such manner as he/she considers fit.
- 10.7.1.2 Lessons learned during the investigation contained in the Final Report are important for improving aviation safety and serves as a means of the Bureau's personnel capacity building. Wide distribution of the Final Report is essential for the prevention of future occurrences and to inform the general public. Accordingly, the Bureau will adhere to the requirements of the SLCAR Part 13, Chapter 6, Section 6.5 and will make Final Reports publicly available as soon as possible and, if possible, within twelve (12) months.
- 10.7.1.3 The Commissioner will distribute copies of the Final Report to all States and parties that participated in the investigation, as well as to the families of the victims of the accident when requested. The Bureau will also forward copies of the Final Report to ICAO, when the aircraft involved has a maximum mass of over 5,700 kg.
- 10.7.1.4 Transparent distribution to the general public assists in maintaining public confidence in the aviation system. The Final Report will be made available to the general public on Bureau's internet website.
- 10.7.1.5 If the Final Report cannot be made publicly available in twelve (12) months, the Commissioner will make an interim statement publicly available on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised.

10.7.2 Interim Statement Tracking

- 10.7.2.1 The status of all open or ongoing investigations are monitored using Microsoft Excel (Spread Sheet) or other means to indicate their anniversary dates. The up-to-date status of each ongoing investigation should be reported by the IIC during the monthly management review meetings.



- 10.7.2.2 The Bureau has established an accident and incident database that is used as a means of tracking the status of open investigations. The Manager of Investigation division is responsible for updating and maintenance of the database. The Manager of Investigation division will conduct a monthly review of the database to identify all the open investigations that are one month to their anniversary. The Manager of Investigation division will direct the concerned IIC to draft an Interim Statement, detailing the progress of the investigation and any safety issues that are raised.
- 10.7.2.3 In addition, if during monthly management review of all open investigations, it appears that for some reason the target date for releasing Final Report within 12 months cannot be feasible, the Commissioner will request the IIC to draft an interim statement detailing the progress of the investigation and any safety issues that are raised.
- 10.7.2.4 The Commissioner shall publish on the Bureau's website the Interim Statement on the anniversary of the date of occurrence of an open investigation.

10.8 SAFETY RECOMMENDATIONS

10.8.1 General

- 10.8.1.1 The sole objective of accident and incident investigations conducted by the Bureau shall be the prevention of accidents and incidents. One very important tool to achieve this objective is the issuance of timely safety recommendations. The intended purpose of a safety recommendation is the prevention of accidents or incidents and the reduction of the consequences of such occurrences. It, in no case, has the purpose of creating a presumption of blame or liability for an accident or incident.
- 10.8.1.2 If, at any stage of an investigation, the IIC becomes aware of a critical safety issue, the IIC will inform the Commissioner as soon as practicable. The Commissioner will then consult the manager of investigation division to make appropriate decision on the critical safety issue raised by the IIC. The Commissioner may recommend in a dated transmittal letter to the appropriate authorities within Sierra Leone, as well as in other States, any prevention action that it considers necessary to be taken promptly to enhance aviation safety.
- 10.8.1.3 Any safety recommendations arising from the investigations in situations wherein immediate action is not needed, or wherein the deficiency is not clearly defined and justified until the Final Report stage, such safety recommendations would normally be included in chapter 4 of the Final Report. Hence the Commissioner will formally forward the final report (safety recommendation inclusive) in a dated transmittal correspondence to the accident investigation authorities of other States concerned and, when ICAO documents are involved, to ICAO.
- 10.8.1.4 In addition, the Commissioner may also make safety recommendations arising from safety studies or other fact finding and analysis exercises carried out by the Bureau.
- 10.8.1.5 The openness of Annex 13 investigations and the involvement of stakeholders in the investigation process should encourage the involved organizations/stakeholders to take action before a recommendation is made.
- 10.8.1.6 Furthermore, the Bureau's Investigators will provide information on any safety issues identified, safety actions already taken, and proposals for safety recommendations to be considered for inclusion in the draft Final Report for comments by relevant States and entities concerned.



10.8.2 Validation of a Safety Issue/Deficiency

The following are steps that would assist in determining the requirement and bases for a safety recommendation:

- a) using the information determined by the investigation, determine the history of the flight of the aircraft and the pre-flight, in-flight and post-flight events that contributed to the adverse consequences related to the occurrence;
- b) from the list of events, determine the safety significant events. Safety significant events would include but not be limited to events:
 - (i) that are undesirable from a risk perspective;
 - (ii) that are potentially linked as an antecedent to another undesirable event;
 - (iii) that are non-standard or unusual; or
 - (iv) where one or more alternative actions or options are available;
- c) for the safety significant event of interest, determine the underlying factors that contributed to or facilitated the event;
- d) for the underlying factor of interest, determine the level of risk. Risk can be defined in terms of two components: the probability that the underlying factor will lead to an adverse consequence and the severity of that adverse consequence;
- e) for the underlying factor of interest, determine the availability and the effectiveness of physical or administrative defences needed to limit, reduce or prevent unwanted consequences;
- f) for the underlying factor of interest, validate the safety deficiency. This validation is based on the results of risk analysis and defence analysis above. A safety deficiency is an underlying factor with risks for which the defences are less than adequate;
- g) for each safety deficiency, determine possible risk-control options that have the potential to mitigate the risk of the safety deficiency contributing to a future occurrence. Each risk-control option must be critically evaluated to determine the benefits that would result from the control option, the administrative and financial feasibility and the reasonableness of the control option; and
- h) based on the preceding analyses, determine the risk-control option that has the best potential for mitigating the risk associated with the validated safety deficiency.



10.8.3 Safety Recommendations Addressees

- 10.8.3.1 Safety recommendation must be communicated to an entity or organization that is best able to take action to mitigate the risks, has the authority and responsibility to take remedial action and has the mandate to take action that will have the broadest impact.
- 10.8.3.2 There should only be one principal action addressee for each recommendation. Having multiple to avoid a situation where there could be uncertainty as to what addressee is responsible for taking safety action; and to avoid making it difficult to track and evaluate action taken in response to the recommendation. In such situations, it would be preferable to send the recommendation independently to each addressee. Alternatively, one addressee could be designated as the lead action addressee and the other addressees designated as support action addressees.
- 10.8.3.3 For Safety recommendations of Global Concern (SRGC), the action addressee normally would be the State civil aviation authority responsible for the certification and oversight, in part, of the design, manufacture, maintenance and/or operations of the aircraft or facilities involved in the occurrence. For other safety recommendations, the action addressee could be, but not be limited to, the air operator, manufacturer, maintenance organization, air traffic services provider and airport operator. ICAO would be the action addressee for recommendations related to the international Standards and Recommended Practices contained in the Annexes to the Convention on International Civil Aviation and perceived deficiencies in ICAO guidance material.
- 10.8.3.4 For the purpose of advancing the safety of operations, copies of the safety recommendation also should be sent to those persons or organizations of the aviation community that have a direct interest in the safety issue or who would benefit from the information that was the basis for the safety recommendation. Information addressees could be, but is not limited to, the following: involved government departments or agencies; involved States and accident investigation authorities; and involved stakeholders, such as the airline, maintenance organization, manufacturer, air traffic services provider, and airport operator.
- 10.8.3.5 The timing of safety communication is influenced by the degree of risk associated with the underlying safety issue.

10.8.4 Writing Safety Recommendations

10.8.4.1 Framework of a safety recommendation

Safety recommendations should be formulated using the SMART principle (such that it is Specific, Measurable, Achievable, Realistic and Time-bound). To be effective, a safety recommendation must present a compelling argument for safety action to mitigate the risks identified by the investigation. A clear, succinct and well-structured safety communication would facilitate this objective. The following is a suggested framework for a safety recommendation, including guidelines as to the type of information that should be included:

- a) The background section should include the following:
 - i) a summary of the occurrence, including the date, aircraft type and location of the occurrence.



This summary should describe what happened, not why it happened. This section should also identify the investigation authority, the investigation number and the status of the investigation;

- ii) the safety significant event associated with the safety issue, along with the adverse consequence(s) that resulted from the associated unsafe condition;
 - iii) the associated safety deficiency(ies), if any; and
 - iv) the immediate circumstances that led to the adverse consequence.
- b) The supporting information section should include the following:
- i) historical evidence of the risks and consequences, by referring to other occurrences where similar circumstances resulted in adverse consequences, to demonstrate that this was not just an isolated occurrence;
 - ii) information as to how the number of such accidents has varied over time, by geographic area, by aircraft type and by type of operation. This section should also include a description of the adverse consequences associated with the occurrences. This information establishes the probability of adverse consequences, and the severity of the consequences in terms of historical evidence; and —
 - iii) the risk control options currently in use and the effectiveness of these options, if applicable.
- c) The deficiency analysis section should include the following:
- i) the unsafe condition/factor underlying the safety significant event;
 - ii) the shortcomings of prior actions taken, if any;
 - iii) the inadequacies of existing defences; and
 - iv) the residual risk.
- d) The safety recommendation section should include the following:
- i) a summary of the safety deficiency statement, including the unsafe condition, inadequacies of defences, and the residual risk (of adverse consequences) if no action is taken; and
 - ii) the recommended safety action (risk-control options), including the performance expectations.
- e) Attachments supporting the integrity of the factual information and argument for change could be appended to the recommendation document, such as, but not limited to, statistics, lists of



similar previous occurrences, technical and scientific analyses, and flight data recorder printouts and analyses.

Note — For safety recommendations issued in Final Reports, the above information is included in the factual information, analysis, conclusions, recommendations and attachments sections of the Final Report.

10.8.4.2 Covering letter for safety recommendations

The covering letter for the safety recommendation shall include the following information:

- a) the specific addressee for a safety recommendation should be the head official of the organization who is best suited to implement the required safety action This could be, but not be limited to, the government minister, director general, secretary general or chief executive officer;
- b) the safety recommendation letter must be dated;
- c) occurrence summary (see framework section);
- d) purpose of the safety recommendation;
- e) safety deficiency statement;
- f) recommended safety action(s); and
- g) requirement to respond within 90 days regarding:
 - i. Actions taken;
 - ii. Actions planned including alternative actions, if applicable; or
 - iii. Reasons why no action will be taken.

Note — For safety recommendations issued in the Final Report, a separate cover letter should be sent to each head official deemed responsible for taking action on a safety recommendation.

10.8.4.3 Distribution of Safety Recommendations

10.8.4.3.1 The purpose of safety communication is to ensure that identified risks are communicated to those entities or organizations best able to effect change and to convince them to take remedial safety action. The openness of Annex 13 investigations and the involvement of stakeholders in the investigation process should encourage the involved organizations/stakeholders to take action before a recommendation is made.

10.8.4.3.2 The Commissioner should ensure that safety recommendation as part of the final report, should be sent to persons or organizations in the aviation community that have a direct interest in the safety issue which was the basis for the safety recommendation, as well as to other members of the aviation community who would benefit from the information, including but not limited to, the following:

- a) the safety recommendation action addressee;



- b) involved government departments;
- c) involved States and accident investigation authorities;
- d) involved stakeholders, such as, but not limited to, the airline, maintenance organization, manufacturer, air traffic services provider and airport operator; and
- e) others who may benefit from lessons learned.
- f) ICAO Accident Investigation Section for Safety recommendation of global concern (SRGC).

Note - Although the Bureau may post its final reports that include safety recommendations on its website, however, for the purpose of advancing the safety of operations, copies of the final reports will also be sent to those persons or organizations of the aviation community that have a direct interest in the safety issue or who would benefit from the information that was the basis for the safety recommendation.

10.8.4.4 Qualities of a good safety recommendation

The following are some qualities of a good safety recommendation:

- a) there is a clear and positive link to a safety significant event;
- b) data are accurate and indisputable;
- c) the analysis is sound;
- d) the safety recommendation is addressed to the entity best able to take the corrective action;
- e) the recommendation is achievable;
- f) there is a significant risk in being too prescriptive;
- g) a performance-based recommendation will make the action taken in response to a recommendation more measurable by both the accident investigation authority and the safety recommendation action addressee
- h) a good recommendation is one that is written in a way that clearly states the deficiency, the action required to mitigate the risk and the expected result of action being taken.

10.8.4.5 Characteristics of a weak safety recommendation

The following are some characteristics of a weak safety recommendation:

- a) the action addressee is not identified;
- b) too many action addressees:



- c) the action addressee does not have the mandate to mitigate the identified deficiency;
- d) the addressee is not the one that can correct the deficiency on a systemic level;
- e) the factual information is incorrect or inappropriately skewed;
- f) the logic linking facts, analysis and conclusions is flawed;
- g) the risk or consequences are exaggerated;
- h) the recommendation is not based on a finding or a cause/contributing factor;
- i) the recommendation is too specific;
- j) the recommendation is too broad;
- k) the recommended action is not achievable;
- l) the performance expectations of the recommendation is unclear;
- m) too many recommendations in a report;
- n) recommendations made on low-risk issues;
- o) recommendation based on a single, local event; and
- p) the recommendation is not clearly identified.

10.8.5 Follow-up of Safety Recommendations

10.8.5.1 The purpose of a safety recommendation is to ensure that identified risks are communicated to those entities or organizations best able to effect change and to convince them to take remedial safety action. In this regard, the issuance of safety recommendations by the Bureau can be viewed as the most important output of the investigation. The full potential of recommendations to prevent future accidents and incidents cannot be realized until appropriate safety action to mitigate the risks underlying the recommendation is taken by the entity to which the recommendation was issued. Measuring the effectiveness of safety recommendations to achieve positive changes requires an evaluation of the actions taken against the performance expectations of the safety recommendation. Refer to Figure 10-1 below for a typical flow diagram for tracking safety recommendations.

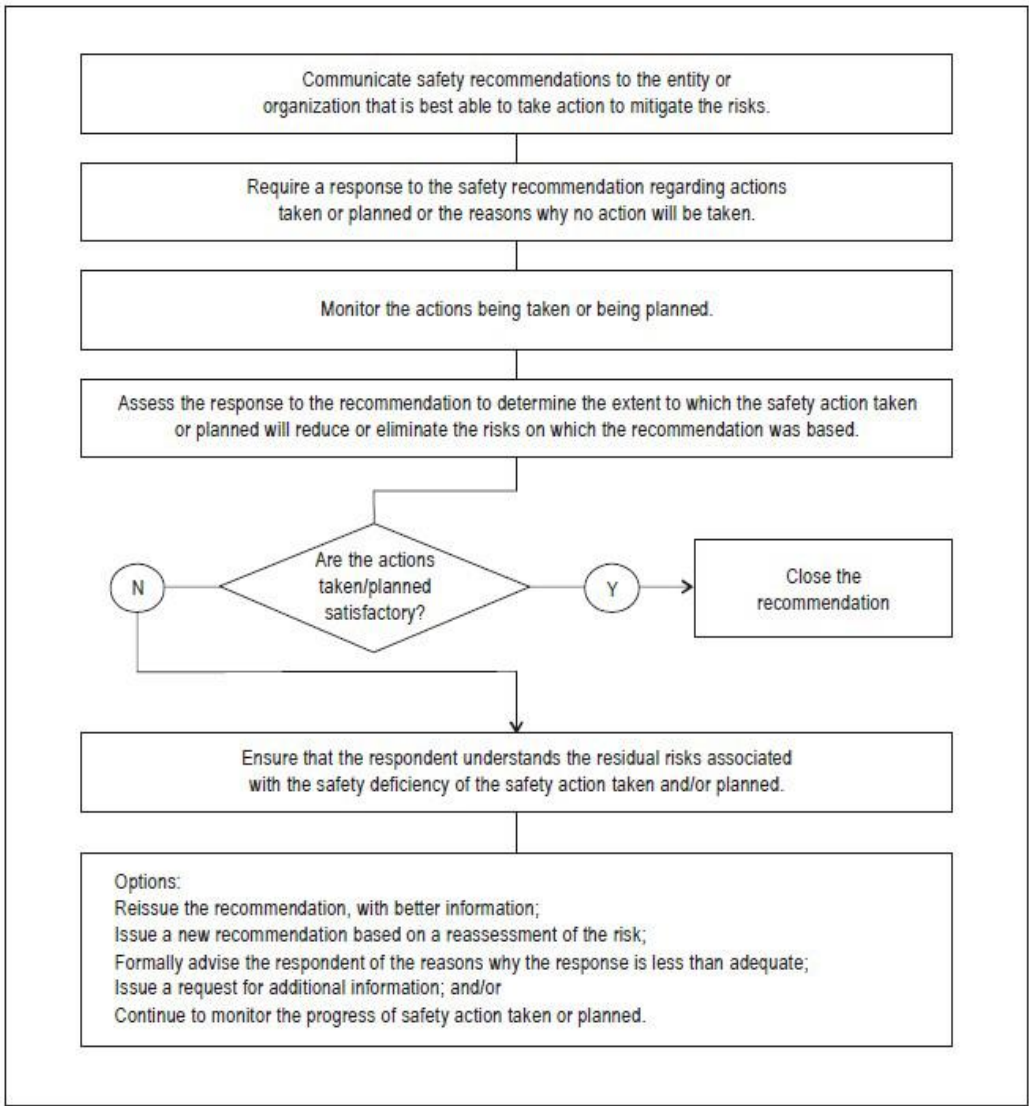


Figure 10-0-1: Typical Flow Chart for Tracking Safety Recommendations

10.8.5.2 The Bureau has a Safety Recommendation “Tracking System” using Microsoft Excel Sheet (AIB Form number AIB.01.04) for monitoring and recording of all the safety recommendations issued to organizations in Sierra Leone and to other States, to determine if safety actions have been taken to satisfy the recommendations, if actions are planned, or the reasons why the recipients are not taking actions.

10.8.5.3 For situations where a response is not received within the prescribed 90 days, the Bureau will formally request a status report from the action addressee to which the safety recommendation was made. If there is a significant change in the action taken or under consideration, the addressee of the recommendation should inform the Bureau of the changes, including reasons why the proposed action has changed.

10.8.5.4 The manager of investigation division is responsible for keeping the records of all outgoing and incoming safety recommendation follow-up correspondence in the accident investigation files.



10.8.5.6 Mandating responses to safety recommendations

ICAO Annex 13 requires that a State that receives safety recommendations shall inform the proposing State, within 90 days of the date of the dated transmittal correspondence, of the preventive action taken or under consideration, or the reasons why no action will be taken. The Commissioner is responsible for ensuring compliance with this standard in Sierra Leone.

10.8.6 Process for Assessing Responses and Action Taken

10.8.6.1 The purpose of evaluating the safety action taken and/or planned is simply to determine whether further safety action is required. The manager of investigation division is responsible for accessing responses and actions taken on safety recommendation.

10.8.6.2 The following is a process for assessing responses to recommendations:

- a) review the recommendation to confirm the performance expectations of the recommendation;
- b) review the response to the recommendation to determine the extent to which the addressee has accepted the existence of the safety deficiency underlying the recommendation;
- c) assess the extent to which the safety action taken or planned will reduce or eliminate the risks on which the recommendation is based;
- d) reassess the residual risks associated with the safety deficiency, taking into account the safety action taken and/or planned; and
- e) categorize the response in terms of risk mitigation.

10.8.6.3 The Commissioner will inform the State responding to a recommendation, in writing, of the assessment of the response as well as post the assessments of the responses to the recommendations on the Bureau's website.

Note — Prior to making public the assessment of responses to recommendations, the Commissioner shall provide advance notice to the State responding to the recommendation of the intent to do so.

10.8.6.4 For each SRGC, the Commissioner will provide the ICAO Accident Investigation Section with a copy of the responses to and status of the recommendation.

10.8.6.5 If it is assessed that a response to a safety recommendation is less than adequate, the Commissioner will contact the authority responsible for taking action on the recommendation to ensure that:

- i. the recipient of the recommendation understands the recommendation and the risk level associated with the safety deficiency;
- ii. the Commissioner understands the substance of the response to the recommendation, including the potential of the action taken and/or action planned to mitigate risk; and



- iii. the recipient of the recommendation understands the residual risks associated with the safety deficiency, taking into account the safety action taken and/or planned.

10.8.6.6 The follow-up options to a less-than-adequate response would vary based on the level of residual risk and the urgency for additional safety action. The following are some options that will be considered:

- a) reissue the recommendation, with changes, additional clarification and/or better information;
- b) issue a new recommendation based on a reassessment of the risk of the underlying deficiency;
- c) formally advise the action addressee of the recommendation as to the investigation authority's assessment of the response, including the reasons why the response is less than adequate;
- d) if appropriate, inform ICAO and/or other States about a less-than-adequate response to a recommendation;
- e) issue a request for additional information from the safety recommendation action addressee; and/or
- f) continue to monitor the progress of the safety action taken or planned.

10.8.7 Handling Safety Recommendations received from other States

10.8.7.1 Upon receipt of letter of transmittal of safety recommendations from another State, the Bureau's Accredited representative to that investigation in coordination with the Commissioner will forward copies of the transmittal letter to the addressees in Sierra Leone (SLCAA, Airline Operator, Freetown International Airport, Air Traffic Services Provider, etc.) within Sierra Leone requesting them to provide their responses in terms of acceptance of the safety recommendations, proposed corrective action plan before the elapse of the prescribed ninety (90) days.

10.8.7.2 The Bureau's accredited representative in coordination with Commissioner will inform the proposing State, within ninety (90) days of the transmittal correspondence, of safety actions taken or under consideration, or the reasons why no actions will be taken.

10.8.7.3 The Bureau's accredited representative in coordination with the manager of investigation unit will inform the proposing State, within ninety (90) days of the transmittal correspondence, of safety actions taken or under consideration, or the reasons why no actions will be taken.

10.9 REOPENING OF AN INVESTIGATION

10.9.1 If, after the Final Report has been released, new factual information becomes available, or if the original analyses were determined to be in error, the Commissioner will reopen the investigation to examine any new evidence or erroneous analyses, using the same procedures for the original investigation.

10.9.2 The Commissioner in coordination with the manager of investigation department, will form a team of experienced investigators to conduct thorough review of the new information or the erroneous analysis without delay.



- 10.9.3 Upon validation of the new factual information or the veracity of the erroneous analysis, the team will forward its recommendations to the Commissioner for reopening of the investigation.
- 10.9.4 If the Commissioner accepts the recommendation of the team to reopen the investigation, the Commissioner will direct the team to conduct a review of the final report in consideration of the new factual information or to correct erroneous analysis in the initial final report. A revised draft Final Report shall be forwarded to the Commissioner.
- 10.9.5 The Commissioner will direct the IIC of initial investigation or the new team leader to inform the States that participated in the initial investigation in a transmittal letter, of the emergence of significant factual information or existence of erroneous analysis and forward to the States a revised draft Final Report, inviting their substantial comments within 60 days.
- 10.9.6 Any substantial comments received within 60 days from the States shall be analysed in accordance with the procedures in section 10.5 – *Consultation* of this manual.
- 10.9.7 Upon completion of the consultation process, the Commissioner shall forward to the States the revised Final Report and cause the ICT Unit to publish it in the Bureau’s internet website.

Note:- A closed investigation may also be reopened, if the wreckage of the aircraft earlier declared missing has been found.



CHAPTER 11 - REPORTING TO THE ICAO ACCIDENT/INCIDENT DATA REPORTING (ADREP) SYSTEM

11.1 ADREP REPORTING SYSTEM – GENERAL

- 11.1.1 Annex 13 — Aircraft Accident and Incident Investigation, requires States to report data obtained during the early stages of an investigation of an accident. ICAO also gathers information on aircraft incidents for safety and accident prevention. For ease of reference, the term “occurrence” refers to accidents, serious incidents and incidents.
- 11.1.2 The ICAO ADREP system collects data from States in order to enhance safety by means of analysis, which is accomplished either by validation of known safety issues or identification of emerging safety trends, leading to recommendations for accident prevention purposes.
- 11.1.3 In accordance with Annex 13, States report to ICAO information on all aircraft accidents which involves aircraft of a maximum certificated take-off mass of over 2 250 kg. ICAO also gathers information on aircraft incidents considered important for safety and accident prevention. Thorough accident and incident investigations identify safety issues in the aviation system, both at the airline level and at the national level. However, it is sometimes difficult to differentiate between isolated manifestations of a problem and systemic unsafe condition with a potential for loss of life or property damage. Such safety issues must be validated; in part, this is done by comparing the accident and incident experience in question with the broader experience of the airline, the State and other States. This type of comparative analysis requires reliable and complete data. The ADREP System operated by ICAO provides States with the data that will assist them in validating safety issues. Based on this validation process with its attendant assessment of risk, accident investigation authorities can offer meaningful recommendations for correcting unsafe conditions in the aviation system.
- 11.1.4 There are two different stages when an ADREP report to ICAO is required after an occurrence.

These are:

- a) ADREP Preliminary Report; and
- b) Data Report

11.2 ADREP PRELIMINARY REPORTS

- 11.2.1 When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the Commissioner will send the Preliminary Report in English language (reference to the SLCAR Part 13, Chapter 7, section 7.1 and Reporting Checklist in appendix J2) to:
- a) the State of Registry or the State of Occurrence, as appropriate;
 - b) the State of the Operator;
 - c) the State of Design;



- d) the State of Manufacture;
- e) any State that provided relevant information, significant facilities or experts; and
- f) ICAO.

11.2.2 When an aircraft involved in an accident has a mass of less than 2 250 kg and when airworthiness or matters considered being of interest to other States are involved, the Commissioner will forward the Preliminary Report (reference to ICAO Annex 13, Chapter 7, paragraph 7.2 and Reporting Checklist in appendix J2) to:

- a) the State of Registry or the State of Occurrence, as appropriate;
- b) the State of the Operator;
- c) the State of Design;
- d) the State of Manufacture; and
- e) any State that provided relevant information, significant facilities or experts.

11.2.3 The Commissioner should ensure that the Preliminary Report be sent within 30 days of the date of the accident. When matters directly affecting safety are involved, the Preliminary Report will be sent as soon as the information is available and by the most suitable and expeditious means available (reference to ICAO Annex 13, Chapter 7, paragraph 7.4 and Reporting Checklist in appendix J2).

11.2.4 The Commissioner will dispatch the Preliminary Report to the States involved and ICAO, in accordance with the SLCAR Part 13, Chapter 7, Section 7.1 to 7.4.

11.3 ADREP ACCIDENT/INCIDENT DATA REPORTS

11.3.1 When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the Commissioner will send, as soon as practicable after the investigation, the Accident/Incident Data Report to ICAO. Further, the Commissioner shall, upon request, provide other States with pertinent information in addition to that made available in the Accident/Incident Data Report (reference to the SLCAR Part 13, Chapter 7, section 7.5 and 7.6).

11.3.2 When the Bureau conducts an investigation into an incident to an aircraft of a maximum mass of over 5,700 kg, the Commissioner will send, as soon as is practicable after the investigation, the Incident Data Report to ICAO (reference to the SLCAR Part 13, Chapter 7, section 7.7).

11.3.3 The Commissioner will dispatch the Accident/Incident Data Report to the States involved and ICAO, in accordance with the SLCAR Part 13, Chapter 7, section 7.5 to 7.7.



11.4 GENERAL INSTRUCTIONS FOR COMPILING

11.4.1 Basic rules

States should report accurate and complete data in accordance with Annex 13 and the guidance in this manual. Some basic rules to observe when reporting occurrences in ADREP-compatible format (e.g., ECCAIRS format) are as follows:

- a) Determine the appropriate occurrence classification, i.e., whether it is an accident, serious incident or incident, based on injury level, aircraft damage and other information available.
- b) Complete the basic data such as date, time, State and location of occurrence, airport (if relevant), severity, aircraft type, operator, operation type and flight phase.
- c) Choose the appropriate units for the attributes before entering values, e.g., ft, MSL or FL for altitude.
- d) If more than one aircraft is involved in an occurrence, provide the information about the other aircraft. When entering event types for more than one aircraft, be sure to select the appropriate aircraft (1 or 2). All events must be in time sequence and care should be taken not to exclude vital events.
- e) Align events with occurrence category(ies).
- f) Use “Unknown” entries only if it is established after investigating that no information was found.
- g) Use “Blank” entries to indicate that the investigation is ongoing to find information that is currently not available.

11.4.2 ADREP Taxonomy

The ADREP taxonomy was developed by ICAO and contains definitions and terminology for aviation accident and incident reporting systems.

11.4.3 Dispatch of the reports

11.4.3.1 When information on the occurrence is available in an ADREP-compatible format (e.g. ECCAIRS format), a copy of the electronic file (e.g. .E5F) should be attached to the notification e-mail and sent to adrep@icao.int and copy: AIGInbox@OACI.onmicrosoft.com.

11.4.3.2 Reports that are completed on paper forms are to be sent to ICAO to the following address:

International Civil Aviation Organization
999 Robert-Bourassa Boulevard,
Montréal, Quebec H3C 5H7,
Canada.



11.5 SPECIAL INSTRUCTIONS FOR COMPILING

11.5.1 Occurrence category coding

11.5.1.1 The ADREP occurrence category taxonomy is part of ICAO's accident and incident reporting system. The occurrence categories are a set of terms used by ICAO to categorize accidents and incidents in order to conduct safety trend analysis. The goal of such analysis is to take pre-emptive action to prevent recurrence of similar accidents or incidents.

11.5.1.2 Most accident and incident sequences involve multiple events. Therefore, strictly coding an accident or incident under a single category can be difficult. For instance, abrupt maneuvering (AMAN) may also result in a loss of control in flight (LOC-I). In this case, the event is coded under both categories, AMAN and LOC-I. ICAO's occurrence category coding philosophy allows the reporter to code multiple categories for a single accident or incident in order to consider or study all events that led to the accident or incident.

11.5.2 Event type coding

11.5.2.1 In order to determine why an accident or incident happened, it is critical to study factors leading up to, during and after the occurrence. It is therefore vital that all event data known at the time of reporting is accurately included.

11.5.2.2 To further describe an event, "descriptive factors" can be entered for each event. Descriptive factors describe, in detail, what happened during an event by listing all phenomena present. If possible, the descriptive factors should be coded in chronological order below each event type.

11.5.2.3 To explain an event, "explanatory factors" can be entered for each descriptive factor. These factors explain why the event happened and include the human factor aspects in the coding of events. They are used to determine what preventive action may be required. The complete set of event types and descriptive and explanatory factors, with their detailed descriptions, can be found on the ICAO ADREP taxonomy webpage.

11.5.2.4 General considerations when reporting events include the following:

- a) Be as specific as possible; for example, if the nose landing gear did not extend, use the event "nose/tail landing gear-related event" and not "landing gear-related event";
- b) Align occurrence categories with events; for example, if the occurrence category is System or Component Failure – Non-Powerplant (SCF-NP), then there must be an event of failure of a non-power plant component/system;
- c) Align events and descriptive factors: events and descriptive factors describe what went wrong, what did not work, what was out of the ordinary and what contributed to the occurrence; for example, the event "central warning-related event" can be used for events where the system malfunctioned, and the descriptive factor "central computers" can be used to specify the event;



- d) Complete the sequence of events in chronological order: an occurrence must be described by the way it is coded. In essence, the event coding should provide a similar image of the occurrence sequence, as is found in the narrative.

11.5.3 Narratives

11.5.3.1 The narrative provides a brief description of the occurrence, including emergency circumstances, significant facts and other relevant information. The narrative shall not exceed 200 words. It is important that events be described in chronological (time) order and be brief and specific.

11.5.3.2 The study and analysis of the sequence of events that led to the occurrence can help to better understand the nature of the occurrence. Therefore, narratives should include a concise summary of all events in order to provide information regarding the events that led to the occurrence. The information provided in a Preliminary Report narrative need not necessarily be repeated in a Data Report. However, any new information obtained subsequent to the Preliminary Report submission must be included in the Data Report. Seen together, the two narratives should provide the complete history of the flight and conclusions of the investigation.

11.5.3.3 When a Preliminary Report has not been submitted (either in the case of an incident or when an accident investigation has been completed within 30 days), the narrative in the Data Report must provide the history of the flight (and the description and analysis of how and why the event occurred), conclusions of the investigation, and findings and causes/contributing factors. In such cases, ideally a total of up to 400 words may be used in the narrative of the Data Report submitted.

11.5.4 Safety recommendations

The reporter should correlate safety recommendations, including safety recommendations of global concern, and actions to the relevant findings, as applicable. The safety recommendation attributes on the Data Report should include any corrective action taken or under consideration. If possible, the safety recommendation should specify how this corrective action would resolve the identified safety problem. Include a summary of preventive action already taken.

11.5.5 Notification and reporting checklist

In the notification and reporting checklist (AIB.01.02 in appendix J), the following terms have the meanings indicated below:

- a) international occurrences - Accidents and serious incidents occurring in the territory of a Contracting State to aircraft registered in another Contracting State.
- b) Domestic occurrences - Accidents and serious incidents occurring in the territory of the State of Registry.
- c) Other occurrences - Accidents and serious incidents occurring in the territory of a non-Contracting State, or outside the territory of any State.



ADREP Preliminary Report

From	Category	Report	To	For	By
State conducting the investigation	Accident	Preliminary	- State of Registry - State of Occurrence - State of the Operator - State of Design - State of Manufacture - Any State providing relevant information, significant facilities or experts - ICAO	Aircraft over 2,250 kg	Within 30 days of the date of the accident
			Same as above, except ICAO	Accidents to aircraft of 2 250 kg or less if airworthiness matters of interest are involved	Within 30 days of the date of the accident
	Incident	Preliminary	Not required		

Note: If, within 30 days, the accident Data Report has been complied and sent to ICAO, no Preliminary Report is required.

ADREP Data Report

From	Category	Report	To	For	By
State conducting the investigation	Accident	Data	ICAO	Aircraft over 2,250 kg	When the investigation has been completed and
	Incident			Aircraft over 5,700 kg	Final report issued



CHAPTER 12 - ACCIDENT PREVENTION MEASURES — ACCIDENT/INCIDENT DATABASE SYSTEM

12.1 INCIDENT REPORTING SYSTEMS

- 12.1.1 In accordance with ICAO Annex 13, Chapter 8, and the SLCAR Part 13, Chapter 8) Sierra Leone has established a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies. Sierra Leone has also established a voluntary incident reporting system that is non-punitive and affords protection to the sources of the information. The Commissioner shall establish a coordination mechanism on joined access to the mandatory and voluntary incident reporting systems of the Authority to facilitate the collection of information that may not be captured by a mandatory incident reporting system.
- 12.1.2 The Commissioner will cooperate with the Sierra Leone Civil Aviation Authority (SLCAA) to maintain and implement a reporting database to facilitate effective analysis and management of information on actual or potential safety deficiencies and to determine any preventive action required in accordance with the relevant Regulations shall similarly be maintained. The database shall be in accordance with the ICAO ADREP compatible taxonomy.
- 12.1.3 The Commissioner will establish a team comprising of the Manager of investigation division and heads of Technical and Operations Units, to analyze the information contained in accident and incident investigation reports and in incident reporting database(s) to determine any preventive actions required. If the analyses of data identify safety matters of interest to other States, the Commissioner will forward such safety information to other States as soon as possible.
- 12.1.4 In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources including safety studies.
- 12.1.5 Regardless of the source of safety recommendations (accident/incident reports, database analyses, or safety studies), if safety recommendations are addressed to an organization in another State, such recommendations will normally be transmitted by the Commissioner through that State's investigation authority.

12.2 ACCIDENT AND INCIDENT DATABASE

- 12.2.1 In compliance with ICAO Annex 13, Chapter 8, and the SLCAR Part 13, chapter 8 Sierra Leone has established and maintains an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine any preventive actions required. The Bureau and the Sierra Leone Civil Aviation Authority, being the State authorities responsible for the implementation of the State Safety Programme (SSP) have access to this database to support their safety responsibilities and fulfil their duties.
- 12.2.2 The Bureau has adopted an ICAO ADREP-compatible system for collection, sharing and exchange of safety information from its accident and incident database.

Note 1 — In accordance with Annex 19, Chapter 5, States are required to establish safety data collection and processing systems (SDCPS) to capture, store, aggregate and enable the analysis of safety data and



safety information. State authorities responsible for the implementation of the SSP, which include accident investigation authorities, have access to the SDCPS to support their safety responsibilities.

Note 2.— SDCPS refers to processing and reporting systems, safety databases, schemes for exchange of information, and recorded information including but not limited to:

- a) data and information pertaining to accident and incident investigations;
- b) data and information related to safety investigations by State authorities or aviation service providers;
- c) mandatory safety reporting systems;
- d) voluntary safety reporting systems; and
- e) self-disclosure reporting systems, including automatic data capture systems.

12.2.3 The Commissioner will establish a team comprising of the Manager of investigation division and heads of Technical and Operations Units to ensure that the information contained in accident and incident investigation reports are analysed to determine any preventive actions required. If the analyses of data identify safety matters of interest to other States, Sierra Leone will forward such safety information to other States as soon as possible.

12.2.4 Regardless of the source of safety recommendations (accident/incident reports, database analyses, or safety studies), if they should be sent to another State, the Commissioner will transmit them to that State's accident investigation authority.

Note —In accordance with Annex 19, Chapter 5, if a State, in the analysis of the information contained in its SDCPS, identifies safety matters considered to be of interest to other States, that State is required to forward such safety information to them as soon as possible. Prior to sharing such information, States will agree on the level of protection and conditions on which safety information will be shared.

Note — Information on the sharing of safety information can be found in the ICAO “Code of conduct on the sharing and use of safety information” in the Global Aviation Safety Plan (Doc 10004”).

12.3 EUROPEAN CO-ORDINATION CENTRE FOR AVIATION INCIDENT REPORTING SYSTEMS (ECCAIRS) DATABASE, ANALYSES AND SHARING OF DATA

12.3.1 Sierra Leone has adopted the European Co-ordination Centre for Aviation Incident Reporting System (ECCAIRS version 1) Programme to meet ICAO Annex 13, Chapter 8 requirements.

12.3.2 ICAO Annex 13 contains requirements for States to establish and maintain an accident and incident database to facilitate the effective analysis of information on actual and potential safety deficiencies obtained, including that from its incident reporting system, and to determine any preventive actions required.



- 12.3.3 The Bureau has established an ICAO ADREP-compatible system for its accident/incident reporting system, as well as for collecting, storing and disseminating relevant safety information.
- 12.3.4 It is noted that the European Union (EU) has established an accident and incident database based on ECCAIRS software, which is fully compatible with the ICAO ADREP system. States are encouraged to implement their accident and incident database based on ECCAIRS, which is made available at no charge.



APPENDICES



APPENDIX A - Civil Aviation Act – Part IX, Aircraft Accidents and Incidents Investigations

Kindly visit the Bureau’s website for the current Civil Aviation Act – Part IX, Aircraft Accidents and Incidents Investigations.



APPENDIX B - Sierra Leone Civil Aviation Regulations – Part 13, Aircraft Accident and Incident Investigations

Kindly visit the Bureau’s website for the current Sierra Leone Civil Aviation Regulations – Part 13, Aircraft Accident and Incident Investigations.



APPENDIX C: AGREEMENTS AND MEMORANDA OF UNDERSTANDING (MOU) WITH OTHER ORGANIZATIONS

Note. For Copies of MoUs refer to the office of the Commissioner for more details.

[Note. This appendix contains principles for State-to-State investigation authority MoUs and a model MoU in respect of aircraft accident and serious incident investigation an accident investigation authority may enter into with another agency or authority. Samples of other agreements regarding assistance and cooperation between the Bureau and other organizations within the State, such as judicial authorities, the CAA, emergency response agencies, ATS, etc., as well as between the Bureau and other States may be found in the Manual of Aircraft Accident and Incident Investigation, Part I — Organization and Planning (Doc 9756).]



APPENDIX D: EXAMPLES OF SERIOUS INCIDENTS

(As per attachment C to the Annex 13)



Sierra Leone Aircraft Accident and Incident Investigation Bureau

4th Floor, National Development Bank Building,
21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aaib.com | Email: info@sl-aaib.com

EXAMPLES OF SERIOUS INCIDENTS (Reference to ICAO Annex 13, Attachment C)

1. The term “serious incident” is defined as follows:

Serious incident. An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an Unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

2. There may be a high probability of an accident if there are few or no safety defences remaining to prevent the incident from progressing to an accident. To determine this, an event risk-based analysis (that takes into account the most credible scenario had the incident escalated and the effectiveness of the remaining defences between the incident and the potential accident) can be performed as follows:
 - a) consider whether there is a credible scenario by which this incident could have escalated to an accident; and
 - b) assess the remaining defences between the incident and the potential accident as:
 - effective, if several defences remained and needed to coincidentally fail; or
 - limited, if few or no defences remained, or when the accident was only avoided due to providence.
- 2.1 Consider both the number and robustness of the remaining defences between the incident and the potential accident.

Ignore defences that failed, and consider only those that worked and any subsequent defences still in place.

Note 1.— The most credible scenario refers to the realistic assessment of injury and/or damage resulting from the potential accident.

Note 2.— Defences include crew, their training and procedures, ATC, alerts (within and outside the aircraft), aircraft systems and redundancies, structural design of the aircraft and aerodrome infrastructure.



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2.2 The combination of these two assessments helps to determine which incidents are serious incidents:

		b) Remaining defences between the incident and the potential accident	
		Effective	Limited
a) Most credible scenario	Accident	Incident	Serious Incident
	No accident	Incident	

3. The incidents listed are examples of what may be serious incidents. However, the list is not exhaustive and, depending on the context, items on the list may not be classified as serious incidents if effective defences remained between the incident and the credible scenario.

- a. Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.
- b. Collisions not classified as accidents.
- c. Controlled flight into terrain only marginally avoided.
- d. Aborted take-offs on a closed or engaged runway, on a taxiway1 or unassigned runway.
- e. Take-offs from a closed or engaged runway, from a taxiway1 or unassigned runway.
- f. Landings or attempted landings on a closed or engaged runway, on a taxiway1 or unassigned runway or on unintended landing locations such as roadways.
- g. Retraction of a landing gear leg or a wheels-up landing not classified as an accident.
- h. Dragging during landing of a wing tip, an engine pod or any other part of the aircraft, when not classified as an accident.
- i. Gross failures to achieve predicted performance during take-off or initial climb.
- j. Fires and smoke in the cockpit, in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.
- k. Events requiring the emergency use of oxygen by the flight crew.
- l. Aircraft structural failures or engine disintegrations, including uncontained turbine engine failures, not classified as an accident.
- m. Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.
- n. Flight crew incapacitation in flight:



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- i. for single pilot operations (including remote pilot); or
 - ii. for multi-pilot operations for which flight safety was compromised because of a significant increase in workload for the remaining crew.
 - o. Fuel quantity level or distribution situations requiring the declaration of an emergency by the pilot such as insufficient fuel, fuel exhaustion, fuel starvation or inability to use all usable fuel on board.
 - p. Runway incursions classified with severity A. The Manual on the Prevention of Runway Incursions (Doc 9870) contains information on the severity classifications.
 - q. Take-off or landing incidents. Incidents such as under-shooting, overrunning or running off the side of runways.
 - r. System failures (including loss of power or thrust), weather phenomena, operations outside the approved flight envelope or other occurrences which caused or could have caused difficulties controlling the aircraft.
 - s. Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.
 - t. The unintentional or, as an emergency measure, the intentional release of a slung load or any other load carried external to the aircraft.
1. Excluding authorized operations by helicopters.



APPENDIX E: TEMPLATE LETTERS

E1. Template Letter requesting for information from the Operator



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4th Floor, National Development Bank Building,
21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aaib.com | Email: info@sl-aaib.com

[DATE]

[Operator]
[Address]

Dear Sir,

REQUEST FOR INFORMATION ON THE [OCCURRENCE TYPE] INVOLVING YOUR [AIRCRAFT TYPE] WITH NATIONALITY AND REGISTRATION MARKS [REG. NO.] WHICH OCCURRED AT [LOCATION] ON [DATE]

The Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB) wishes to request for the following information:

a) Manufacturer, model, nationality and registration marks, serial number of the aircraft.	
b) Qualification of the pilot-in-command, and nationality of crew and passengers.	
c) Last point of departure and point of intended landing of the aircraft.	
d) Number of crew.	
e) Number of passengers onboard the aircraft.	
f) Are dangerous goods carried onboard the aircraft?	
g) Description of the dangerous goods (type/nature)	
h) Identification, markings and packaging of the dangerous goods.	
i) Location(s) of the dangerous goods.	
j) Quantity of the dangerous goods.	
k) Documentation of the dangerous goods.	
l) Any other pertinent information	

Please accept the assurances of the highest regards of the Commissioner.

[Name of Signatory]

[Designation]
Sierra Leone Aircraft Accident and Incident Investigation Bureau
(SL-AAIIB)

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E2. Template Letter of Transmittal of Draft Final Report to Other States



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4th Floor, National Development Bank Building,
21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aaib.com | Email: info@sl-aaib.com

[DATE]

[Stakeholder]
[Address]

Dear Sir,

LETTER OF TRANSMITTAL

DRAFT FINAL REPORT ON THE [OCCURRENCE TYPE] INVOLVING [AIRCRAFT TYPE] OWNED AND OPERATED BY [OPERATOR'S NAME] WITH NATIONALITY AND REGISTRATION MARKS [REG. NO.] WHICH OCCURRED AT [LOCATION] ON [DATE]

The Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIB) is hereby inviting the under listed stakeholders for their respective, significant and substantial comments on the captioned report in compliance with ICAO Annex 13, sub section 6.3.

The Bureau invites you to provide comments on the report within sixty (60) days from the date of this transmittal letter, to amend or to include substance of comments received in accordance with sub section 6.3 of ICAO Annex 13.

This transmittal letter requests you to kindly forward this draft report to the operator and the organization responsible for the design and final assembly of the aircraft as applicable, as applicable, for their comments.

This draft final report is confidential and should not be disclosed or shared to the public.

Please accept the assurances of the highest regards of the Commissioner.

[Name of Signatory]
[Designation]

Sierra Leone Aircraft Accident and Incident Investigation Bureau
(SL-AAIB)

PARTICIPATING STAKEHOLDERS IN THE INVESTIGATION [List all stakeholders here]

- a. Sierra Leone Civil Aviation Authority (SLCAA)
- b. []
- c. []

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E3: Template Letter of Transmittal of Draft Final Report to Authorities and Organizations in Sierra Leone



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21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aiib.com | Email: info@sl-aiib.com

[DATE]

[Stakeholder]
[Address]

Dear Sir,

LETTER OF TRANSMITTAL

DRAFT FINAL REPORT ON THE [OCCURRENCE TYPE] INVOLVING [AIRCRAFT TYPE] OWNED AND OPERATED BY [OPERATOR'S NAME] WITH NATIONALITY AND REGISTRATION MARKS [REG. NO.] WHICH OCCURRED AT [LOCATION] ON [DATE]

The Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB) is hereby inviting the under listed stakeholders for their respective, significant and substantial comments on the captioned report in compliance with ICAO Annex 13, sub section 6.3.

The Bureau invites you to provide comments on the report within thirty (30) days from the date of this transmittal letter, to amend or to include substance of comments received in accordance with sub section 6.3 of ICAO Annex 13.

This draft final report is confidential and should not be disclosed or shared to the public.

Please accept the assurances of the highest regards of the Commissioner.

[Name of Signatory]

[Designation]

Sierra Leone Aircraft Accident and Incident Investigation Bureau
(SL-AAIIB)

PARTICIPATING STAKEHOLDERS IN THE INVESTIGATION [List all stakeholders here]

- a. Sierra Leone Civil Aviation Authority (SLCAA)
- b. []
- c. []

E4: Template Letter of Granting of Observer/Participant Status



Sierra Leone Aircraft Accident and Incident Investigation Bureau

4th Floor, National Development Bank Building,
21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aaib.com | Email: info@sl-aaib.com

[DATE]

Dear [NAME OF OBSERVER/PARTICIPANT],

GRANTING OF OBSERVER/PARTICIPANT STATUS

[ACCIDENT FILE NUMBER]
[AIRCRAFT REGISTRATION]
[LOCATION]

The Sierra Leone Aircraft Accident and Incident Investigation Bureau (SL-AAIIB), herein referred to as the Bureau, is empowered to investigate aircraft accidents in Sierra Leone. The objective of the investigation is to advance aviation safety by identifying safety deficiencies and making recommendations designed to eliminate or reduce deficiencies.

During the course of an accident investigation, the Bureau may authorize a person to attend as an observer when the person is designated as such by a Minister responsible for a government having a direct interest in the investigation and/or another State Investigation Authority, or as a participant when, in the opinion of the Bureau, the person has a direct interest in the subject-matter of the investigation and will contribute to achieving the objective of (name of the investigation authority).

By this letter, you are granted the status of an observer or a participant to this accident and, subject to any conditions that the (name of the investigation authority) may impose and under the supervision of an investigator, you may:

- (a) Attend at the accident site;
- (b) Examine the aircraft, its component parts and contents;
- (c) Unless otherwise prohibited by law, examine relevant documents; and
- (d) Attend laboratory examination and testing.

Your attendance as an observer/participant is subject to the following conditions:

- (a) You shall limit your activities at the accident site to those outlined by the investigator-in-charge;
- (b) You shall ensure that your activities do not restrict or otherwise interfere with the investigators in the performance of their duties; and
- (c) You shall ensure that the information you gain as a result of your observer/participant status is not disclosed to any unauthorized person.

Failure to comply with any of the above conditions and responsibilities could result in the immediate revocation of your observer/participant status.

You should also understand that the privileges of an observer/participant will be exercised at your own risk.

Please sign and return the attached copy of this letter to the investigator-in-charge, indicating your understanding and acceptance of the above-mentioned conditions and responsibilities.

Please accept the assurances of the highest regards of the Commissioner.

[Name of Signatory]
[Designation]
Sierra Leone Aircraft Accident and Incident Investigation Bureau
(SL-AAIIB)

PARTICIPATING STAKEHOLDERS IN THE INVESTIGATION [List all stakeholders here]

- a. Sierra Leone Civil Aviation Authority (SLCAA)
- b.
- c.

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APPENDIX F: WRECKAGE AND PARTS RELEASE FORM

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SLAAIIB-M-TECH001- APDX.D
		Ed. & Rev.:	ED1 - RV0
		Date:	
WRECKAGE AND PARTS RELEASE FORM			
Occurrence Reference: <input style="width: 90%;" type="text"/>			
The Bureau is conducting an investigation into the following aviation safety matter:			
Investigation Title and/or other description: (aircraft make, model, registration, date of occurrence, etc.) <input style="width: 95%; height: 40px;" type="text"/>			
The items listed below are no longer required by the Bureau as part of its safety investigation.			
Note. – It is strongly recommended that components be inspected by authorized personnel where it is intended for them to be returned to operational service.			
Items details (description and condition)		Date returned	
<input style="width: 95%;" type="text"/>		<input style="width: 50%;" type="text"/>	
<input style="width: 95%;" type="text"/>		<input style="width: 50%;" type="text"/>	
<input style="width: 95%;" type="text"/>		<input style="width: 50%;" type="text"/>	
<input style="width: 95%;" type="text"/>		<input style="width: 50%;" type="text"/>	
<input style="width: 95%;" type="text"/>		<input style="width: 50%;" type="text"/>	
Signature: (IIC or Delegate)		Name: (IIC or Delegate)	Date:
Phone:		Fax:	Email:
Please return a signed copy of this form to the above person at The Sierra Leone Aircraft Accident and Incident investigation Bureau (SL-AAIIB). Owner or agent acknowledgement			
I accept custody of the listed items.			
Owner or agent's name:		Phone:	
Signature of owner or agent:		Date:	
<hr style="border: 0; border-top: 1px solid black;"/>			
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APPENDIX G: LIST OF SAFETY INVESTIGATOR KITS, EQUIPMENT AND TOOLS

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SL-AAIB/00
		Revision:	00
		Date:	01/12/2021
LIST OF SAFETY INVESTIGATOR KIT			
S/N	DESCRIPTION	QUANTITY	LOCATION
1	Go-kit Bag		
	Digital Camera		
	Digital Voice Recorder		
	Clip board		
	Magnifying glass		
	Calculator		
	Note pad		
	Erasable Marker		
	Permanent Marker		
	Binoculars with Digital Compass		
	Power Bank		
	Torch light with batteries		
	Respirators		
	Safety Goggles		
	Gloves		
	Flash drives		
	Marking Flags		
	Safety Flares		
	Mosquito Repellent		
	Steel Rule		
Steel drinking cup			
2	PPE (PERSONAL PROTECTIVE EQUIPMENT)		
	Safety Shoes		
	Safety Rain boots		
	SL-AAIB Work Coveralls		
	SL-AAIB Rain Coats		
	Tyvec Bio-hazard full body suit		
	SL-AAIB Reflective Jackets		
	Safety Helmets		
	Hand Gloves (rubber, leather and disposable)		
	Chemical Respirators with multiple filters		
Insect Repellent			
3	Go-kit Quick Response Mobile Container		
	Laser Measure		
	Go-Pro Cameras and kits		
	First aid box		
	Hand Gloves (rubber, leather and dispensable)		
	Chemical Respirators with multiple filters		
	Insect Repellent		
Magnifying glass			
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APPENDIX H: GUIDELINES ON PERSONAL PROTECTIVE EQUIPMENT AGAINST BIOLOGICAL HAZARDS



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21/24 Siaka Stevens Street, Freetown, Sierra Leone, West Africa.
Website: www.sl-aaib.com | Email: info@sl-aaib.com

GUIDELINES ON PERSONAL PROTECTIVE EQUIPMENT AGAINST BIOLOGICAL HAZARDS

The following provides general guidelines on the personal protective equipment to be used by accident investigators at the accident site. The protective equipment may also be required when performing off-site examinations and tests on wreckage parts.

Disposable latex gloves. Latex gloves should be durable even though they are to be worn under work gloves. All latex gloves should be properly disposed of prior to leaving the accident site.

Work gloves. Work gloves should be as durable as practical and provide the hand, wrist and forearm with puncture and abrasion protection. Leather, nitrile and kevlar gloves are commonly used. All three types should be disinfected or properly disposed of prior to leaving the accident site.

Face masks. Face masks should cover the nose and mouth. Masks comes in disposable and reusable configuration and should be disinfected or properly disposed of prior to leaving the accident site.

Protective goggles. Protective goggles should enclose the eyes by sealing around the top, bottom and side. Common safety glasses are not acceptable. Goggles should be fitted with one-way check valves or vents to prevent fogging and should be disinfected or properly disposed of prior to leaving the accident site.

Disposable protective suits. Protective suits should be durable and liquid-resistant and should fit properly. If possible, they should have elastic-type hoods and elastic pant cuffs. Duct tape can be used to alter the suits and to patch tears. Protective suits should be properly disposed of prior to leaving the accident site.

Disposable shoe cover and protective boots. Disposable shoe covers made of polyvinyl chloride (PVC) or butyl rubber are recommended. Leather, rubber or Gortex work boots are also acceptable. Disposable shoe covers and protective boots should be disinfected or properly disposed of prior to leaving the accident site.

Disinfection chemicals. Two chemical types are commonly used to disinfects personal protective equipment. Rubbing alcohol of 70 per cent strength is effective and is available in towelettes, as well as in large hands towels. The most effective disinfection solution is a mixture of common household bleach and water, with one part bleach to ten part of water. Never mix alcohol and bleach.

Biological hazard disposal bags. Biological hazard disposal bags must be used for disposal of contaminated personal protective equipment. The bags are red or orange and are labelled "Biological hazard". For transport, the disposed materials should be double bagged.



APPENDIX I: ACCIDENT SITE HAZARD IDENTIFICATION AND RISK ASSESSMENT CHECKLIST

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SL-AAIIB/00
		Revision:	00
		Date:	01/12/2021
ACCIDENT SITE HAZARD IDENTIFICATION AND RISK ASSESSMENT CHECKLIST			
INVESTIGATION NUMBER	AIRCRAFT TYPE/REGISTRATION MARKS/OPERATOR		
DATE	ASSESSMENT PRODUCED BY		

ITEMS TO BE CHECKED	DANGER	NO	NOT	REMARKS
	EXITS	DANGER	KNOWN	

THE WRECKAGE

1. Danger of fire
2. Hot areas after fire
3. Flammable fuel
4. Other flammable liquids
5. Acid material
6. Dangerous goods
7. Risk of explosion
8. Ammunition or pyrotechnics
9. Risk of electric shock
10. Dangerous components
11. Toxic fumes
12. Sharp glass and/or metal
13. Sharp composite material
14. Risk of collapsing structures
15. Risk of falling material
16. Bio-hazard
17. Pressurized components
18. Electromagnetic radiation
19. Radioactive radiation
- 20.



- 21. Pressurized systems
- 22.
- 23. Composite ash

ENVIRONMENTAL RISKS

- 24. Other traffic
- 25. Rain
- 26. Heat
- 27. Darkness or bad lighting
- 28. Slippery areas
- 29. Risk for the injury
- 30. Risk of falling
- 31.
- 32. Risk of drowning
- 33. Risk of violence
- 34. Dangerous wildlife

OTHER FACTORS

- 35. Protective equipment insufficient
- 36. Lack of resources
- 37. Lack of proper tools
- 38. Rush and/or fatigue
- 39. Lack of vaccinations
- 40. Other danger


RESULT OF RISK ASSESSMENT (are the risks acceptable and actions required)

THIS DOCUMENT MUST BE FILED IN INVESTIGATION FOLDER



APPENDIX J: REPORTING FORM AND REPORTING CHECKLIST

J0- REPORT RECEIVING CHECKLIST

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SLAAIB-M-TECH001- APDX ---
		Ed. & Rev.:	ED1 - RV0
		Date:	
REPORT RECEIVING CHECKLIST			

SN	Action
1.	The Personnel on duty receives call on the emergency number informing of an occurrence.
2.	Acknowledge the call and introduce yourself.
3.	Ask the following questions to obtain preliminary: <ul style="list-style-type: none"> a. What is your name? b. Where are you calling from? c. What is your report? d. What time did it happen? e. Is there smoke, fire, survivor, etc? f. Kindly describe the terrain? (It is motorable) g. What's the weather condition of the site? h. Can you take some pictures or videos of the site and send it via WhatsApp to [mobile number]? i. How far are you from the site of occurrence? j. How can we reach you for further information? k. How can we reach you for further information? l. What is the aircraft model and manufacturer? m. What is the name of the operator or owner of the aircraft? n. What is the registration marks of the aircraft? o. Who else have you informed? p. Have any rescue efforts been made and who is helping out?
4.	Immediately inform the Commissioner about the report received.

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J1: ACCIDENT/ INCIDENT REPORT FORM

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.: SL-AAIIB/00	
		Revision: 00	
		Date: 01/12/2021	
ACCIDENT/ INCIDENT REPORT FORM			

24hrs Emergency Lines:
+232

Part 1

ACCIDENTAL DETAILS

Occurrence:

Date: Time: Local/UTC
(delete as appropriate)

Location:

Lat/Long or OS Grid (if not on airfield):

SL-AAIIB File Reference:

Please fill in this form in **CAPITAL LETTERS** and **black ink** only. We will electronically scan and store the information you provide. Use the reverse of the form as a continuation sheet if necessary. Please complete as much information as possible.

Notes	<p>1. AIRCRAFT</p> <p>1.1 AIRCRAFT DETAILS</p> <p>Registration: Manufacturer:</p> <p>Generic Name: Type and Series:</p> <p>Engine Model: No of Engines: Build Year:</p> <p>C of A Category: C of A Issue Date:</p> <p>1.2 CHECKS</p> <p>Total airframe hours: Last check type: Date:</p> <p>1.3 MAINTENANCE DETAILS</p> <p>Company:</p> <p>Address: Tel:</p> <p>Post Code: Email:</p>
	<p>2 OPERATOR DETAILS</p> <p>Company:</p> <p>Address: Tel:</p> <p>Post Code: Email:</p>
	<p>3 COMPANY FLIGHT SAFETY OFFICER</p> <p>Name:</p> <p>Company:</p> <p>Address:</p> <p>Post Code: Email:</p>
Tick boxes as appropriate	<p>4 FLIGHT</p> <p>4.1 FLIGHT DETAILS</p> <p>Purpose of flight: <input type="checkbox"/> Passenger <input type="checkbox"/> Cargo <input type="checkbox"/> Non-Revenue <input type="checkbox"/> Training</p> <p>Departure airfield: Departure time: Local/UTC:</p> <p>Planned destination:</p> <p>4.2 WEIGHTS AND LOADING DETAILS (attach Load sheet if available)</p> <p>Basic: (kg) C of G:</p> <p>Max take-off weight: (kg) Max landing weight: (kg)</p> <p>No of Crew: Weight: (kg) No of Passengers: Weight: (kg)</p> <p>Fuel type: Weight: (kg) Baggage/Freight: Weight: (kg)</p>
Delete local/UTC as appropriate	

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SL-AAIB Policy and Procedures Manual

Thank you for completing Part 1 of this form.

In Part 2, you are asked to provide a sketch of the site and a narrative description of the accident. Any accompanying photographs and or documents will be returned, at your request, once the investigation is complete.

If you do not want a copy of Part 2 to be sent to the SLCAA please tick the box below.

Do not send a copy of Part 2 of the form to the SLCAA



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Aircraft Accident / Serious Incident Report Form

Part 2

Show North and site elevation (amsl). If accident occurred on an airfield for which there is no published information. Please provide as much detail as possible.

Any photographs of the site and/or aircraft would greatly assist the investigation.

12. SKETCH ACCIDENT SITE





J2 - REPORTING CHECKLIST

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SL-AAIIB/00
		Revision:	00
		Date:	01/12/2021
ACCIDENT/ INCIDENT REPORT FORM			

24hrs Emergency Lines:
+232

Note.— In this checklist, the following terms have the meaning indicated below:
 — International occurrences: accidents and incidents occurring in the territory of a Contracting State to aircraft registered in another Contracting State.
 — Domestic occurrences: accidents and incidents occurring in the territory of the State of Registry.
 — Other occurrences: accidents and incidents occurring in the territory of a non-Contracting State, or outside the territory of any State.

NOTIFICATION AND REPORTING CHECKLIST			
1. ACCIDENTS, SERIOUS INCIDENTS AND INCIDENTS TO BE INVESTIGATED			
From	For	Send to	ICAO Annex 13 reference
State of Occurrence	International occurrences: all aircraft	State of Registry State of Operator State of Design State of manufacture ICAO (when aircraft over 2,250 kg or is a turbo-powered aeroplane)	4.1
State of Registry	Domestic and other occurrences	State of Operator State of Design State of manufacture ICAO (when aircraft over 2,250 kg or is a turbo-powered aeroplane)	4.8

NOTIFICATION AND REPORTING CHECKLIST				
2. FINAL REPORT				
Accidents and incidents wherever they occurred				
From	Type of report	Concerning	Send to	ICAO Annex 13 reference

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State conducting the investigation	FINAL REPORT	All aircraft	State instituting the investigation State of Registry State of the Operator State of Design State of Manufacture Other States participating in the investigation State having suffered fatalities or serious injuries to its citizens State providing information, significant facilities or experts	6.4
		Aircraft over 5,700 kg	ICAO	6.7

NOTIFICATION AND REPORTING CHECKLIST				
3. ADREP REPORT				
Accidents and incidents wherever they occurred				
From	Type of report	Concerning	Send to	ICAO Annex 13 reference
State conducting the investigation	PRELIMINARY REPORT	Accidents to aircraft over 2,250 kg	State of Registry or State of Occurrence State of the Operator State of Design State of Manufacture State providing information, significant facilities or experts ICAO	7.1
		Accidents to aircraft of 2,250 kg or less if airworthiness or matters of interest are involved	Same as above, except ICAO	7.2
	ACCIDENT DATA REPORT	Accidents to aircraft over 2,250 kg	ICAO	7.5
	INCIDENT DATA REPORT	Incidents to aircraft over 5,700 kg	ICAO	7.7

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NOTIFICATION AND REPORTING CHECKLIST				
4. ACCIDENT PREVENTION MEASURES				
Safety matters of interest to other States				
From	Type	Concerning	Send to	ICAO Annex 13 reference
States making safety recommendations	Safety recommendations	Recommendations made to another State	Accident investigation authority in that State	6.8 8.3
		ICAO documents	ICAO	6.9





APPENDIX K: INITIAL ACTIONS AFTER NOTIFICATION CHECKLIST

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SLAAIB-M-TECH001- APDX.K
		Ed. & Rev.:	ED1 - RV0
		Date:	

INITIAL ACTIONS AFTER NOTIFICATION CHECKLIST

INVESTIGATION NUMBER	AIRCRAFT TYPE/REGISTRATION MARKS/OPERATOR
DATE	COMPLETED BY

Action	Time	Action started	Action completed
Notification received			
Contact accident site (police / chief of recue)			
Guidance given to police/rescue <ul style="list-style-type: none"> - Secure the site including ground marks - Crew alcohol test - Drug test if needed - Avoid disturbing wreckage and ground marks - Do not remove bodies - Document all actions - Cover wreckage and pieces, marks from rain - Stop leaking fluids, collect examples in bottles 			
Start documenting (photos and videos)			
Contact Commissioner and other investigators			
Verbal decision to initiate preliminary investigation			
Form the team for on-site investigation			
Departure to accident site <ul style="list-style-type: none"> - Check protective and investigation equipment needed - Travelling arrangements 			
Accommodation			

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Action	Time	Action started	Action completed
Contact Air Rescue Coordination Center for more info			
If accident on sea, contact Maritime Rescue Center			
Information on DGR from the operator, ATC or rescue forces			
Request from ATC <ul style="list-style-type: none"> - Radio recordings - Telephone recordings - Radar data - Flight plan - 			
Recordings <ul style="list-style-type: none"> - FDR and CVR - Military radar data if needed 			
Contact airport and request <ul style="list-style-type: none"> - Document braking marks etc. on runway - Save all weather recordings 			
Contact operator or owner, request <ul style="list-style-type: none"> - Information of crew and passengers - DGR 			
Inform Commissioner frequently			
Notifications <ul style="list-style-type: none"> - State of the operator - State of registry - State of manufacturer and design - ICAO if required - States of victims 			
Official decision to investigate <ul style="list-style-type: none"> - Investigation team formed - Document the decision - Distribution of the decision 			
Produce distribution list with contact information to all relevant parties			

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APPENDIX L: NOTIFICATION FORM

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.: SLAAIB-M-TECH001- APDX.L	
		Ed. & Rev.: ED1 - RV0	
		Date:	
Accident/Incident Notification Form			
Information required			
a) for accidents the identifying abbreviation ACCID, for serious incidents SINCID and for incidents INCID.			
b) manufacturer, model, nationality and registration marks, serial number of the aircraft			
c) name of owner, operator and hirer, if any, of the aircraft			
d) qualification of the pilot-in-command, and nationality of crew and passengers			
e) date and time (local time or UTC) of the accident or serious incident			
f) last point of departure and point of intended landing of the aircraft			
g) position of the aircraft with reference to some easily defined geographical point, and latitude and longitude			
h) number of crew and passengers aboard killed and seriously injured; others; killed and seriously injured			
i) description of the accident or serious incident and the extent of damage to the aircraft, so far as is known			
j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence			
k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site			
l) identification of the originating authority and means to contact the investigator-in-charge (IIC) and the accident investigation authority of the state Occurrence at any time, and			
m) presence and description of dangerous goods carried on board the aircraft			
<p>¹ It may be helpful to provide the elevation of the accident site, if it is known</p> <p>² It is useful to first provide the number of persons aboard (crew, passengers) and then the injuries they sustained</p>			
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APPENDIX M: INVESTIGATION EVENT CHECKLIST AND ASSIGNMENT CHART

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.: SLAAIIB-M-TECH001-APDX.M	
		Ed. & Rev.: ED1 - RV0	
		Date:	
INVESTIGATION EVENT CHECKLIST			

INVESTIGATION NUMBER	AIRCRAFT TYPE/REGISTRATION MARKS/OPERATOR
DATE	COMPLETED BY

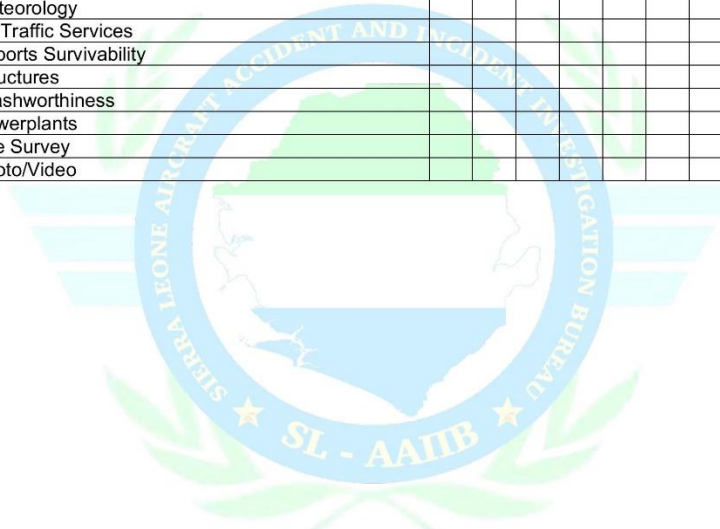
Status	Description
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Make hotel and travel reservations
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Complete initial notification form for the accident
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify accident site terrain and climate
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify on scene commander and phone number
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Coordinate initial site security with local authorities
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Coordinate toxicology and autopsy for the pilot
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Coordinate time and place of media briefings
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Secure weather, airport, aircraft and pilot information
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Print maps and get directions to the accident site
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify insurance adjuster's name and phone number
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify party members and coordinate an initial meeting
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify key personnel and exchange contact information
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Identify and coordinate special requirements for the investigation
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Coordinate component recovery and hangar space
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Request radar data and communication transcripts plus audio tapes
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Request pilot briefing information, transcripts and audio tapes
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Request witness names and statements from local authorities
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Recover flight recorders
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Request police and fire department reports, including photos
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Locate and review pilot's log book and training records
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Locate and review airframe, engine, and propeller logbooks
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Establish an out-briefing date, time and place
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Photographs the site from a minimum of eight points
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document terrain, weather and vegetation at the site
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document position and altitude of major components
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document wreckage distribution and impact markings
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document airframe impact, fire and aerodynamics damage
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document propeller or turbine blade signatures
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document airframe, engine and propeller data plate information
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document flight control positions and establish continuity
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document lifting device positions and settings
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document engine control positions and establish continuity
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document pressurization system and settings
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document landing gear system positions and settings
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document flight instruments and avionics
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document switches and circuit breakers
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document engine instruments and systems instruments
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document warning lights and annunciator statuses
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document oxygen system and establish continuity
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document hydraulic system and establish continuity
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document fuel system and establish continuity
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Document power-plant and accessory items
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Interviews (crew, ops and maintenance personnel) and request written statements
<input type="checkbox"/> Complete <input type="checkbox"/> N/A	Give the pilot or operator form 001 with instructions

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Investigation Event Task-Assignment Chart

Investigation Group	Assignment Events											
Administrative Support												
Head Office Coordinator												
Media Coordinator												
Site Safety Coordinator												
Investigator-in-charge												
Deputy Investigator-in-charge												
Operations												
Aircraft Performance												
Human Factors												
Medical and Pathology												
Witness												
Flight Recorders												
Meteorology												
Air Traffic Services												
Airports Survivability												
Structures												
Crashworthiness												
Powerplants												
Site Survey												
Photo/Video												





APPENDIX N: DOCUMENT AMMENDMENT FORM

	Sierra Leone Aircraft Accident and Incident Investigation Bureau	Ref. No.:	SLAAIIB-M-TECH001- APDX.N
		Ed. & Rev.:	ED1 - RV0
		Date:	
DOCUMENT AMMENDMENT FORM			
AMENDMENT ORIGINATOR USE			
Document Title:			
Section:	Page:	Paragraph:	Revision:
The Requested Change:			
<input type="checkbox"/> <i>Additional information attached</i>			
Reason(s) for the amendment:			
<input type="checkbox"/> <i>Additional information attached</i>			
Originator Name & Sign.:			Date:
DOCUMENT APPROVAL OFFICE USE			
Officers Consulted Regarding the Amendment		Sign. & Date	
Director of Human Resource			
Legal Adviser			
Head of Security and Safety			
Head of ICT			
Director of Engineering			
Director of Operations			
Commissioner			
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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