

# Guidelines

## Investigator Training and Education



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# ISASI

*“Air Safety through Investigation”*

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# **THE INTERNATIONAL SOCIETY OF AIR SAFETY INVESTIGATORS (ISASI)**

## **GUIDELINES**

### **FOR INVESTIGATOR TRAINING AND EDUCATION**

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#### **1 - INTRODUCTION**

1.1 ISASI: The International Society of Air Safety Investigators (ISASI) comprises both individual and corporate members worldwide. ISASI was formed to promote air safety by the exchange of ideas, experiences and information about aircraft accident and incident investigations, and to otherwise aid in the advancement of flight safety by establishing a code of ethics and conduct for investigators, by establishing ISASI positions on various investigation matters and by developing guidelines in investigator training and education.

1.2 STATUS OF THESE GUIDELINES: These guidelines reflect investigator training and education requirements believed to be both appropriate and beneficial to air safety investigations. They are evolutionary in nature and will be updated periodically. The ISASI International Council has approved these guidelines.

#### **2 - TERMS OF REFERENCE**

2.1 The International Council appointed a Working Group of ISASI members and provided the following terms of reference: "The investigators training and education group will:

A. Use the definitions found in the ISASI Members Handbook for the following terms:

Air Safety Investigator (ISASI Bylaws, Revised 1993)  
Investigation (ISASI Positions, 1st Edition, 1994)

B. Use appropriate definitions found in the ICAO Aircraft Accident and Incident Investigation Annex 13 (8th Edition, 1994).

C. Identify the task requirements of Air Safety Investigations.

D. Identify the general education and training requirements of an Air Safety Investigator.

E. Recommend the training and experience levels for the Air Safety Investigators who investigate aircraft accidents or incidents as:

Investigator-In-Charge  
Accredited Representative  
Advisor  
Specialist  
Observer

F. Identify methods of obtaining appropriate education, training, and experience for Air Safety Investigators to participate in aircraft/incident investigation at their desired level of involvement.

G. Update the guidelines as new knowledge and technology becomes available."

### **3 - DEFINITIONS**

3.1 INVESTIGATION (ISASI DEFINITION): A systematic process of examining an aircraft accident or incident, or any other activity aimed at identifying and eliminating hazards to aviation. (ISASI Positions, First Edition, 1994.)

3.2 INVESTIGATION (ICAO DEFINITION): A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations. (ICAO, Annex 13, 8th Edition, 1994.)

3.3 AIR SAFETY INVESTIGATOR (ASI): A person who is or has been actively engaged in the investigation of aircraft accidents or incidents or in accident prevention activities designed to

identify, eliminate or control aviation hazards before they result in accidents or incidents. (ISASI Bylaws, Revised 1993.)

3.4 INVESTIGATOR-IN-CHARGE (IIC): A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation. (ICAO, Annex 13, 8th Edition, 1994.) NOTE: The term IIC applies only to the head of an investigation conducted by a contracting state under the provisions of ICAO Annex 13.

3.5 ACCREDITED REPRESENTATIVE: A person designated by a State on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State. (ICAO, Annex 13, 8th Edition, 1994.)

3.6 ADVISOR: A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation. (ICAO, Annex 13, 8th Edition, 1994.)

3.7 SPECIALIST: A person invited to participate in or assigned to an investigation because of his or her specialized knowledge, skills or experience. (ISASI IT&E Working Group.)

3.8 OBSERVER: A person allowed to accompany Air Safety Investigators for the purpose of observing and/or learning the investigation process. (ISASI IT&E Working Group.)

3.9 INVESTIGATION TYPES: While aircraft accident investigations are commonly thought of as being conducted by a government (state), ISASI recognizes that there are other types of investigations conducted under different procedures for different purposes and with different requirements for reports. These include military investigations and those conducted by private or commercial activities. In addition, some investigations are conducted by a team or group while others are conducted by a single individual. The training and education needs of the investigator will vary with the type of investigation.

#### **4 – GUIDELINES FOR GENERAL EDUCATION AND TRAINING FOR AIR SAFETY INVESTIGATORS**

4.1 The following guidelines for general education and training for air safety investigators have been prepared by the ISASI. They are intended for use by organizations that have a need to conduct aircraft accident investigations.

##### **4.2 TASK REQUIREMENTS OF AIR SAFETY INVESTIGATIONS**

4.2.1 Understanding of technical matters such as aircraft operations and accident investigation.

4.2.2 For an investigation conducted by a state, understanding of the proper level of investigation needed that will conform with governing directives of that particular state.

4.2.3 Ability to collect, document and preserve all evidence involved in an aircraft accident, minimizing additional damage. This includes, but is not limited to: photography, witness interviewing, aircraft and air crew records, wreckage diagramming, field investigation, and system analysis.

4.2.4 Ability to analyze the evidence and produce an accident or incident investigation report, in accordance with the appropriate governing directives, or the procedures required by the investigating organization.

4.2.5 Ability to determine the need for and sources of technical assistance.

## **5 – GUIDELINES FOR EDUCATION STANDARDS AND RECOMMENDED PRACTICES**

5.1 Air Safety Investigators come from many different academic backgrounds. To describe a specific curriculum or academic discipline (Engineering, Psychology, Computer Science, etc.) would be inappropriate. A more appropriate effort would be to list the general educational needs that would allow the ASI to observe, document and analyze data and will allow the ASI to write a technical accident or incident report. General education in the following areas would be appropriate.

- Mathematics and Science
- Engineering
- Communication Skills including:
  - Verbal
  - Written
  - Technical Report Writing
- Computer Science
- Management
- Psychology
- Cognitive Analytical Skills

## **6 – GUIDELINES FOR TRAINING STANDARDS AND RECOMMENDED PRACTICES**

6.1 All Air Safety Investigators require formal training commensurate with their responsibilities as Air Safety Investigator, Investigator-In-Charge, Accredited Representative, Advisor or Specialist. Training requirements may be waived based on an assessment of the ASI's experience and the ASI's responsibility during the investigation.

### **A. Indoctrination**

1. Applicable Legislation and Regulations
2. Investigative Organizations
3. Types of Investigations
4. Definitions and Accident Classification
5. International Agreements (ICAO Annex 13, 8th Edition, 1994))
6. Ethics and Conduct (ISASI Code of Ethics and Conduct, Revised 1983)

7. Principles of Investigation
8. Sources of known precedent

#### B. Initial Response

1. Scene Control/Security
2. Relationship with Local Authorities
3. Recovery of Human Remains
4. Scene Safety
5. Investigator Safety
6. Relationship with News Media, Legal, and Public
7. Family Assistance

#### C. Investigative Organization

1. Authority and Responsibility
2. Use of Specialists
3. Parties to the Investigation (if applicable)
4. Rights of Accredited Representatives (if applicable)
5. Observers
6. Investigative Equipment
7. Investigation Management

#### D. Data Collection

1. Scene Documentation
  - a. Photography (day and night)
  - b. Diagrams
  - c. Airfield Information
  - d. Weather
2. Wreckage Documentation
  - a. Wreckage Inventory
  - b. Land and Water Impacts
  - c. Structures
  - d. Fire
  - e. Propulsion
  - f. Systems
  - g. Instruments
3. Aerodynamic Loads and Structural Failure Modes
  - a. Tension
  - b. Compression
  - c. Bending
  - d. Torsion
  - e. Shear
4. Aircraft Documentation
  - a. Airworthiness
  - b. Maintenance History
  - c. Accident History
5. Helicopter Documentation

- a. Airworthiness and Aerodynamic Considerations
- b. Maintenance History
- c. Accident History
- 6. Flight Crew Documentation
  - a. Qualifications
  - b. Proficiency
  - c. Training
  - d. Procedures
- 7. Accident Sequence Documentation
  - a. Witnesses
  - b. Air Traffic Control
  - c. Recorders
  - d. Cockpit Instruments
- 8. Human Factor Documentation
  - a. Cause of Injury/Fatality
  - b. Survivability
  - c. Physical Factors
  - d. Psychological Factors
  - e. Physiological Factors
  - f. Night Vision Equipment

E. Data Analysis

- 1. Analytical Techniques
- 2. Computer Analysis
- 3. Simulator Analysis
- 4. Non-Destructive Inspection Techniques

F. Report Development

- 1. Report Outline and Construction
- 2. Report Writing and Editing
- 3. Development of Findings
- 4. Development of Recommendations
- 5. Report Review for Quality and Technical Accuracy

**7 – GUIDELINES FOR METHODS OF OBTAINING TRAINING**

7.1 FORMAL TRAINING is available from various civilian and military institutions. NOTE: ISASI does not endorse specific courses or schools that offer aircraft accident investigation training.

7.2 INFORMAL TRAINING can sometimes be obtained by requesting “Observer Status” on investigations conducted by government investigating agencies.

**8 – GUIDELINES FOR CONTINUING EDUCATION AND TRAINING**

8.1 All Air Safety Investigators are encouraged to maintain their investigative skills by reviewing current aircraft and investigation technology.

## 8.2 FORMAL

- A. New Technology Aircraft Courses
- B. New Technology Investigation Courses

## 8.3 INFORMAL

- A. ISASI Conferences and Seminars
- B. Other Technical Seminars Involving Accident Investigation
- C. Professional Reading

## 9 - UPDATES

9.1 These guidelines will be updated as new knowledge and technology becomes available.