

903

Safety Guidelines SG 903:
Guidelines for Incident
Investigations and Best
Practices for Prevention



Airlines for America®
We Connect the World

ATA Safety Guidelines SG 903

Guidelines for Incident Investigations and Best Practices for Prevention

Revision 2014.1

Airlines for America
1301 Pennsylvania Ave., N.W., Suite 1100
Washington, D.C. 20004-1707

Copyright © 2014 Air Transport Association of America, Inc. (d/b/a Airlines for America). All rights reserved. No part of this document may be reproduced or transmitted by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, except as may be expressly permitted in writing by the publisher.

Use of this document is subject to the warranty and license agreement contained on pages 2, 3 and 4

PRODUCT LICENSE AGREEMENT

AIR TRANSPORT ASSOCIATION OF AMERICA, INC. ("ATA") (d/b/a Airlines for America)

IMPORTANT -- PLEASE READ THIS ENTIRE AGREEMENT CAREFULLY
BEFORE INDICATING YOUR ACCEPTANCE OF IT BELOW

YOU AGREE TO BE BOUND BY THE TERMS OF, AND BECOME PARTY TO, THIS AGREEMENT. THIS AGREEMENT IS APPLICABLE TO THE ACCOMPANYING MERCHANDISE (THE "MERCHANDISE"), THE INFORMATION RESIDING THEREON OR ON INTERNET WEB SITES ACCESSIBLE EXCLUSIVELY VIA LINKS FROM THE MERCHANDISE (THE "CONTENT") AND THE RELATED SOFTWARE (COLLECTIVELY, THE "LICENSED PRODUCT"). IF YOU DO NOT AGREE TO BE BOUND BY THE TERMS OF, AND BECOME PARTY TO, THIS AGREEMENT, YOU CANNOT USE ANY PART OF THIS DOCUMENT AND CANNOT SHARE IT WITH OR FORWARD IT TO ANY OTHER PERSON OR ENTITY.

IMPORTANT INFORMATION

The Product contains specifications, practices and other information relating to the covered topics. ATA does not mandate the use of all or any part of the Licensed Product and your decision to use the Licensed Product is entirely voluntary, your decision and at your own risk. You may choose to use the Content in whole, in part, or not at all.

There may be practices, standards and/or governmental requirements applicable to your operations that exceed, or vary from, the Licensed Product. You are solely responsible for determining if such practices, standards or regulatory requirements exist and whether they apply to your activities, and for complying with those that are applicable. Such practices, standards and regulatory requirements can change significantly over time. Unless ATA expressly states otherwise in writing, nothing in this Agreement shall be interpreted as requiring ATA to provide you with updates, revisions, or information about any development or action affecting the Licensed Product.

The Licensed Product has been compiled by ATA and/or its licensors. ATA and/or its licensors reserve title to and ownership of the Licensed Product and all copyrights and any other intellectual property rights in it.

DESCRIPTION OF LICENSE

Upon your acceptance of this Agreement, you will be permitted to access the information for which you have obtained the license described and limited below.

The extent of permissible access to the Licensed Product to you and within your company depends on the type of Licensed Product that ATA has provided to you. Access is as follows:

1. If you purchased the Licensed Product for individual use ("single-user"), access to the Licensed Product shall be limited to one employee in your company but not to any third parties.
2. If you purchased the Licensed Product for multiple person use ("multi-user") or you are a member of the ATA E-Business Program, you can allow access to the Licensed Product to multiple employees within your company but not to third parties. Such employees shall be bound by all the provisions of this Agreement. Single user and multi-user employees may use the Licensed Product for the internal business purposes of your company, and each may print a single copy of any Licensed Product for purposes of designing, structuring or modifying any of your company's products or services as authorized below. The license that this Agreement provides you is subject to any applicable payment and is non-exclusive and worldwide. ATA can terminate this license if you materially fail to comply with the terms of this Agreement.

This Agreement does not authorize you to, and you shall not:

1. Alter, modify, translate, adapt or create derivative works based on the Licensed Product or any related software. Notwithstanding the foregoing prohibition, you may include or apply elements of the Licensed Product in a work that you exclusively produce.
2. Reverse engineer, reverse assemble, reverse compile, decompile, disassemble or otherwise derive source code for the software component of the Licensed Product.
3. Access or attempt to gain access to any part of the Licensed Product except as expressly permitted in this Agreement.
4. Use the Licensed Product on any network or permit any third party to access or use the Licensed Product except as expressly permitted in this Agreement.
5. Use the Licensed Product or any part thereof in any manner that infringes the intellectual property or other rights of another entity or person, including ATA.
6. Sublicense or assign this Agreement.
7. Indicate that ATA endorses, approves, or certifies your application of the Licensed Product, including, without limiting the generality of the foregoing prohibition, your use of specifications contained in the Licensed Product.

ATA CREDIT

If the Licensed Product is used to design, structure or modify any of your or your company's products or services, you must reference, in a commercially reasonable location, the fact that the Licensed Product has been so used.

LIMITED WARRANTY

ATA warrants that at the time of delivery, THE LICENSED PRODUCT will be free from defects in materials and workmanship. In the event of a breach of the foregoing warranty, as your sole and exclusive remedy and ATA's sole liability, ATA will replace any LICENSED PRODUCT having defects in materials or workmanship at no charge, provided you inform ATA within 30 days after your receipt of the Product.

WARRANTY DISCLAIMER

EXCEPT AS EXPRESSLY STATED ABOVE, THE LICENSED PRODUCT IS PROVIDED "AS IS" AND ATA HEREBY EXPRESSLY DISCLAIMS, ON BEHALF OF ITSELF AND ALL PERSONS WHO CONTRIBUTED TO THE CREATION, PUBLICATION, REVISION AND/OR MAINTENANCE OF THE LICENSED PRODUCT, ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. NEITHER ATA NOR ANY PERSON WHO CONTRIBUTED TO THE CREATION, PUBLICATION, REVISION OR MAINTENANCE OF THE LICENSED PRODUCT WARRANTS THAT THE LICENSED PRODUCT WILL MEET YOUR REQUIREMENTS, THAT THE OPERATION OF THE LICENSED PRODUCT WILL BE ERROR FREE, OR THAT IT IS ACCURATE, COMPLETE, CURRENT OR RELIABLE.

LIMITATION OF LIABILITY

YOU ACKNOWLEDGE THAT YOU HAVE RECEIVED THE LICENSED PRODUCT WITHOUT CHARGE. IN NO EVENT WILL ATA OR ANY PERSON WHO CONTRIBUTED TO THE CREATION, PUBLICATION, REVISION OR MAINTENANCE OF THE LICENSED PRODUCT BE LIABLE FOR ANY DAMAGES, INCLUDING, WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE, OR THE INABILITY TO USE, THE LICENSED PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING LIMITATIONS OF LIABILITY, NEITHER ATA NOR ANY PERSON WHO CONTRIBUTED TO THE CREATION, PUBLICATION, REVISION OR MAINTENANCE OF THE LICENSED PRODUCT IS RESPONSIBLE FOR LOST PROFITS OR REVENUE, LOSS OF THE USE OF THE LICENSED PRODUCT, LOSS OF DATA, OR THE COST OF ANY SUBSTITUTE PRODUCT.

This Agreement shall be governed in its interpretation and enforcement by the laws of the District of Columbia, without regard to choice of law principles.

This is the entire agreement between the parties about the subject matter of this Agreement. Any change to this Agreement must be in writing and agreed to by both parties.

Comments about or suggested changes to the Licensed Product should be sent to:

Publications Department
Air Transport Association of America, Inc.
1301 Pennsylvania Avenue, NW, Suite 1100
Washington, DC 20004-1707
USA

Or

pubs@airlines.org

YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO IT, AND THAT YOU HAVE THE AUTHORITY TO AGREE TO IT ON BEHALF OF YOUR COMPANY. IF YOU DO NOT AGREE TO BE BOUND BY THE TERMS OF, AND BECOME PARTY TO THIS AGREEMENT, YOU CANNOT USE ANY PART OF THIS DOCUMENT AND CANNOT SHARE IT WITH OR FORWARD IT TO ANY OTHER PERSON OR ENTITY.

Important Information about This Document

Read Before Using This Document

This document contains recommended guidelines that have been developed for the covered topics. Airlines for America (A4A) does not mandate their use. You must decide whether or not to use the recommendations in this document. You may choose to use them in whole, in part, or not at all.

There may be practices, standards and/or regulatory requirements applicable to your operations that exceed or otherwise differ from the recommendations in this document. You are solely responsible for determining if such practices, standards or requirements exist and whether they apply to your activities, and for complying with those that are applicable. Such practices, standards and requirements can change significantly over time. A4A is not obligated to inform you of such changes.

A4A does not guarantee, promise or warrant that the guidelines in this document will meet the needs of your operations. This is a determination that you must make and for which A4A is not responsible.

For Technical Information or Submissions

Errata information for A4A Publications is available at the A4A Publications Web page.

For technical information or to recommend an alteration or amendment to this specification, please submit the recommendation and any supporting documentation to A4A:

E-mail: pubs@airlines.org

Phone: 202-626-4062

Highlights

Release History

Revision 2014.1:	July 2014
Revision 2009.1:	March 2009
Revision 2006.1:	March 2006
Original Issue:	March 2005

Revision 2014.1

Location	Description of Change
----------	-----------------------

Throughout	Rewrite/New Materials
------------	-----------------------

Revision 2009.1

Location	Description of Change
----------	-----------------------

Chapter 3	New Material
Chapter 4	New Material
Chapter 5	New Material
Chapter 6	Previously Chapter 3
Chapter 7	Previously Chapter 4; Revised the term Passenger Loading Bridge (PLB) to Passenger Boarding Bridge (PBB)
Chapter 8	Previously Chapter 5
Chapter 9	Previously Chapter 6

Revision 2006.1

Location	Description of Change
----------	-----------------------

1-1	Original Issue Chronological update and terminology correction
1-2	Emphasis on 'accident prevention' vs. 'correction'
1-2-1	Grammatical correction
1-2-2	Grammatical correction
1-3-1	'Airworthy' vs. 'flyable'; Formatting
2-1-5	Clarification: change of wording to eliminate redundancy/inappropriate abbreviation
3-1	Clarification
3-2-1	Clarification
3-3	Syntax; clarification
4-2	New Material
5-1	Clarification
5-4	Clarification
6-1	Syntax
6-2	Syntax

Original Issue 2005.1

Location	Description of Change
-----------------	------------------------------

All

Original Issue

Contents

PRODUCT LICENSE AGREEMENT	2
Important Information about This Document	5
Highlights	6
Chapter 1. Introduction	10
1-1. Scope of Document	10
1-2. Overview	10
1-3. Impact of Incidents.....	10
1-4. Definitions	11
Chapter 2 Conducting an Investigation	12
2-1. Investigation Objectives.....	12
2-2. Investigator Training	12
2-3. Utilization of Investigation/Response Kit and Checklist	13
2-4. Arrival on the Scene	13
2-5. Documenting/Preserving Evidence	13
2-6. Documenting the Scene	14
2-7. Interviewing	14
2-8. Root Cause Analysis and Contributing Factors	15
2-9. Human Factors	16
2-10. Completing the Report.....	16
2-11. Safety Recommendations and Post-Investigation Risk Assessment.....	17
Chapter 3 Belt Loader Damage Prevention – Safety Guidelines	18
3-1. Overview	18
3-2. Damage Causes	18

Chapter 4. Cargo Loader Damage Prevention – Safety Guidelines	25
4-1. Overview	25
4-2. Damage Causes	25
4-3. Preventive Measures	26
Chapter 5. Passenger Boarding Bridge Damage Prevention – Safety Guidelines	35
5-1. Overview	35
5-2. Damage Causes	35
5-3. Preventive Measures	36
Appendix A: Incident Investigation / Response Kit.....	41
Appendix B: Sample Investigation Checklist.....	42
Appendix C: Sample Investigation Form.....	45
Appendix D: Sample Job Hazard Assessments	49

Chapter 1. Introduction

1-1. Scope of Document

This document is intended to provide users with a set of guidelines addressing proper investigative and reporting methods for near-miss ground events or one resulting in employee injury or aircraft damage.

1-2. Overview

The ramp can be a hazardous environment for both employees and aircraft. Ramp operations, especially those at hubs, tend to occur in bursts of high-tempo activity associated with aircraft arrival and departure banks. Flights are scheduled to maximize the utilization of each aircraft. At hubs, there is the additional requirement to facilitate the orderly connection of passengers arriving from and departing to feeder destinations. These servicing activities take place around the clock and during all kinds of weather. These conditions all help drive how planeside activities are conducted, but also set the stage for the most common types of injuries and damage to occur.

Complacency, lack of situational awareness, failure to follow standard operating procedures (SOP), and on-time pressures are some of the leading causes for both injuries and accidents.

1-3. Impact of Incidents

No one wants to see a colleague injured on the job. Because of that, we all have a common interest in developing and adhering to practices that minimize injuries on the ramp. When an aircraft is damaged it incurs repair costs. These vary widely, based on the severity of the damage and the specific components affected. However, the “cost” potential of aircraft ground damage goes well beyond simple time, materials and labor calculations if the aircraft’s operational availability is affected.

Any time an aircraft sustains or is suspected to have incurred damage, a licensed maintenance technician must inspect the point of contact. If there is no damage, or if the damage is so slight as to have no effect on airworthiness, the technician may make a logbook entry and release the aircraft for revenue flight. Cosmetic repairs may involve replacing a light lens or re-painting a metallic surface. However, more serious damage has the potential to incur sizeable costs beyond those of the repair alone.

Aircraft can be damaged by ground operations in ways that negatively affect airworthiness preventing them from being used in revenue service until they can be repaired. For example, damage to a door sill that precludes pressurization of the aircraft would result in the loss of multiple passenger segments until it could be repaired. The loss of each of those segments would constitute

an economic loss to the carrier; compensation to passengers for company-caused cancellations would add to the cost, as would bringing in replacement aircraft, ferrying the damaged aircraft to a repair station, and similar activities required to mitigate both the damage and the resulting schedule disruption. Another intangible and often overlooked cost is the impact on the airline brand. With the rise in popularity of social media, damage to the airline brand can happen almost immediately.

1-4. Definitions

For the purposes of this document:

Investigation – ICAO Annex 13 (and adopted for the purposes of this document) defines as:

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.

Incident – An employee injury or aircraft ground damage event.

Found on arrival (FOA) – Damage that is considered “pre-existing” and is discovered at a downline station upon arrival.

Human Factors – Personal and professional factors that can affect an individual’s ability of perform effectively and efficiently. Those factors include inadequate skills, training, work knowledge, discipline and organization factors.

Job Hazard Analysis (JHA) – A method to identify existing and/or potential hazards of a job.

Safety Data Sheet (SDS), formerly known as Material Safety Data Sheet (MSDS) – A document that outlines information and procedures for handling and working with chemicals.

Chapter 2 Conducting an Investigation

2-1. Investigation Objectives

Investigations are conducted to determine the facts, conditions and circumstances pertaining to known or suspected safety hazards or risks so that appropriate steps and corrective actions may be taken to prevent or mitigate the impact of a recurrence. Investigations should generate robust, fact-base reports including contributing operational, environmental, human and technical factors for preventative action. The investigative process should be separate and segregated from any disciplinary process or actions.

Aircraft damage, injuries, and near misses should all be investigated.

2-2. Investigator Training

Formal training may not be required for an investigator; however, knowledge in the following areas (either on the job or in a formal setting) is recommended:

- Investigative techniques.
- Communication skills.
- Interpersonal relations.
- Personal development.
- Leadership skills.
- Team dynamics.
- Accident/incident investigation and analysis.
- Airport design and operations.
- Bloodborne pathogen protocol.
- Report writing.
- Human factors.
- Interviewing techniques.
- Conflict resolution.
- Organizational behavior.
- Photography.
- Root cause analysis.
- Scene and evidence preservation.
- Scene security.

2-3. Utilization of Investigation/Response Kit and Checklist

Responding to an incident can range from the very mild to the very traumatic. The use of an incident investigation/response kit and checklist ensures you have the proper tools to conduct an investigation and that all the proper notifications including those to federal agencies when applicable are made and that all company policies, procedures and investigative steps are followed.

An example of an incident investigation/response kit contents can be found in Annex A.

An example of an investigation checklist can be found in Annex B.

2-4. Arrival on the Scene

Always ensure the scene is safe before proceeding. Tend to any injuries that may have resulted from the incident. Consider what Personal Protective Equipment (PPE) you may need to have in any **Incident Investigation/Response Kit** considering the environment, weather, etc.

Incident Investigation/Response Kit checklists should include pre-printed numbers in the notification tree including any federal agencies (i.e. OSHA, NTSB, etc.)

2-5. Documenting/Preserving Evidence

Unless there is imminent danger to persons or equipment, keep all items related to the incident in the exact position they were at the time of the event. Maintain the original position until photographs, sketches, and/or measurements can be recorded.

Pay particular attention to and document equipment identifying numbers, position and condition of control levers (i.e. gear selectors, throttle positions, etc.), and any obstructions to the operator. Equipment directly involved should be removed from service until a qualified mechanic can conduct a thorough inspection. Inspection findings must be documented.

Document the path of travel of the equipment involved; where was it coming from and where was it headed. Again, any obstructions to visibility or to the proper movement of controls should be documented.

For aircraft damage that is found on arrival, documenting the scene may include collecting video from upline stations as well as statements from their employees.

2-6. Documenting the Scene

Photograph the area from various angles. Include photos that give an overview of the entire scene and move inward toward the site of the incident.

The Big Picture



Big Picture clearly identifies what you are looking at. Example shows a left wing and engine.

The Regional Picture



Regional Picture narrows the scope of what you are looking at. Example shows the bottom portion of the cowling.

The Close-up



Close-up focuses on the damage itself. Include a scale (ruler or coin).

Document/obtain the following:

- Eyewitness and contact information of those involved in the incident. Try to interview them as soon as possible while the event is still fresh in their mind. Obtain and/or review written statements and sketches if possible.
- Post Incident evaluation/screening.
- All equipment information (ID #, type/model, etc), tools, or materials involved.
- JHAs, training materials and training records.
- Environmental factors - visibility, light, falling precipitation, etc.
- Video from the airport or other tenants that may cover the scene.
- MSDS/SDS records of all chemicals present (if applicable).
- Use a ruler, tape measure or any other item of known size to record the dimensions of skid marks, dents, cuts, etc.

2-7. Interviewing

Interviewing witnesses to an incident is a critical part of the investigation process.

Some general items to consider for conducting an interview are:

- Conduct the interview as soon as practical following an event so the event is fresh in the mind of the witness.
- Ensure the setting is appropriate.
- Use a scribe to capture notes so you can focus on listening to the witness.

- Prepare questions ahead of time. Ad hoc questions can always be added as the interview unfolds. Questions should also be open-ended and worded in a way to avoid any type of bias, allowing the witnesses to share their experience as they recall the events.
- Allow the witness to talk; do not interrupt.
- Interview the witnesses separately.
- Encourage the witness to sketch/draw the scene and events.
- Ask the employee for corrective suggestions.

2-8. Root Cause Analysis and Contributing Factors

Once it is determined exactly **what** happened, attention should be focused on **why** it happened. When describing **why** an event has occurred, it is important to show the link between root cause(s) and the undesired outcome. The analysis of factual information should identify the logical sequence of events that led to the undesired outcome and failures in performing task. Once failures have been identified, determine which failures contributed to the undesired outcome. Possible causal factors can be human performance failures, equipment failures and or inadequate procedures. The Analysis should also identify possible hazards in performing the task or possible systemic issues. Contributing factors are conditions that contribute to an error and they can be environmental, organizational, and/or human factors.

The Sample Investigation Form in Annex C shows examples of some contributing factors as they apply to aircraft ground damage or employee injury.

The form is comprised of four sections:

Section 1: General Information – Includes Type of Event and Phase of Operation.

Section 2: Impact of Event – Provide information of the impact including cancellation and delay information, and a description of the event. Only record facts that lead up to the event. Do not include assumptions or anecdotal information.

Section 3: Contributing Factors Checklist – There are eight potential contributing factors listed including: environment, equipment, communication, ergonomics, procedures, individual factors, leadership and organizational factors. It is only necessary to complete the factors that contributed to the event. If the factor did not contribute, then move to the next factor. If a factor did contribute, then provide details in the open field area below that factor. Typically there are multiple contributing factors of a single incident. All contributing factors should be identified to diminish the likelihood of a repeat of the same or similar type of incident.

Section 4: List Contributing Factor and Associated Corrective Action – Documents corrective actions identified in Section 3 and corrective action plan. Each contributing factor shall have an associated corrective action. An entity within the organization or individual responsible

for completion of an estimated completion date shall be assigned to each corrective action. The status of each corrective action shall be tracked to completion and once completed the intended impact shall be validated.

2-9. Human Factors

The term “human factors” has grown increasingly popular as the commercial aviation industry realized that human error, rather than mechanical failure, underlies most accidents and incidents. As ICAO defines, “Human factor is about people in their living and working situations; about their relationship with machines, with procedures and with the environment about them; and also about their relationships with other people”. A human factors-based approach to investigation considers how groups of people interact and operate, and why they behave in particular ways. This includes how organizations manage risks and balance their safety obligations with their business metrics. It also examines unintended consequences from changes to Standard Operating Procedures (SOPs). The investigation of human factors is an integrated part of the whole investigation and it should address key factors related to the prevention of recurring human errors.

There are many organizations who teach human factors, human factors in investigations and process design.

2-10. Completing the Report

The Investigation Report (preliminary and final) must contain all the pertinent information obtained throughout the investigation. The report should contain the following:

- Event summary.
- Sequence of the events.
- Facts and analysis including root cause and contributing factors.
- Recommendations and corrective actions.
- Post-Investigation Risk assessments, if applicable.

Subject Matter Experts (SME) and/or those who are party to the investigation should proofread the report for accuracy before distribution within your organization.

Reports or event details should be shared as quickly as practical with similar operating groups within your organization for awareness to prevent reoccurrence until all corrective actions can be implemented.

Maintain and preserve reports in a searchable electronic database for future tracking and trending.