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AEROSPACE RECOMMENDED PRACTICE

ARP5151™ REV. A

Issued 2006-10
Reaffirmed 2013-05
Revised 2019-08

Superseding ARP5151

(R) Safety Assessment of General Aviation Airplanes and Rotorcraft in Commercial Service

RATIONALE

ARP5151 is updated commensurate with changes in ARP5150A and to reflect current industry practices.

INTRODUCTION

Safety is not self-sustaining. When an aircraft is delivered and is in its original type certificated condition, it has an initial level of safety. As it is operated, the level of safety is maintained through a continuing process of monitoring service experience, identifying safety related issues and opportunities, and then addressing these issues or opportunities through appropriate product or procedure changes. This continuing process may be referred to as the “ongoing safety assessment process.”

This document provides a systematic process for assessing ongoing safety of general aviation airplanes and rotorcraft (GAR). This process is intended to assist in focusing available resources in areas that maximize the potential to improve commercial aviation safety. Ongoing safety assessment relies on a cooperative effort among individual commercial operators, manufacturers, suppliers, airworthiness authorities, and other aviation service providers. There are variations in current practices throughout the industry. This document provides guidelines intended to enhance consistency of approach in how aircraft safety assessments are conducted and how GAR aircraft are operated in commercial service worldwide. This document is not a regulation. It is, rather, a reference summary of best practices where a reader can go to obtain more detailed information. The user is not constrained to use any of the elements contained within this document. This document allows a user to seek improvements by comparing existing methods with those listed herein.

To improve safety during the complete aircraft life cycle, it is not sufficient to assess the safety of the aircraft only during its design phase. Ongoing aircraft operations should be evaluated for safety (e.g., maintenance or operation procedures). The aircraft is evolving and changing during the “in-service” phase (e.g., product improvements, modifications). For these reasons, safety should be assessed during the “in-service” phase of the aircraft life cycle. In order to do that, information can be collected, monitored, and analyzed. In addition to maintaining the safety of the aircraft, there is also a desire to enhance safety. The GAR aircraft accident rate has been steadily declining. Use of information within this document is intended to continue this industry improvement.

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TABLE OF CONTENTS

1. SCOPE ... 3
1.1 How to Use This Document ... 3
1.2 Intended Users ... 3

2. REFERENCES ... 4
2.1 Applicable Documents ... 4
2.1.1 SAE Publications ... 4
2.2 Related Publications ... 4
2.2.1 Code of Federal Regulations (CFR) ... 4
2.2.2 FAA Publications ... 5
2.2.3 Other Publications ... 5
2.3 Definitions ... 5
2.4 Abbreviations ... 5

3. ONGOING SAFETY ASSESSMENT ... 6
3.1 Ongoing Safety Assessment Process ... 6
3.1.1 Hazard Identification ... 7
3.1.2 Risk Assessment ... 7
3.1.3 Risk Reduction/Mitigation ... 7
3.1.4 Risk Control Implementation ... 7
3.1.5 Hazard Tracking ... 7
3.2 Ongoing Safety Assessment Process Customization ... 8

4. METHODS AND TOOLS ... 9
4.1 Risk Assessment Matrix ... 9
4.2 Hazard Tracking ... 9
4.3 Hazard Reporting ... 9

5. RISK ASSESSMENT METHODOLOGIES ... 9
5.1 Rotorcraft Risk Analysis Handbook ... 10
5.2 Small Airplane Risk Assessment ... 10
5.3 Transport Airplane Risk Assessment Method ... 11

6. NOTES ... 11
6.1 Revision Indicator ... 11

APPENDIX A SAMPLE OF AIRWORTHINESS ISSUE TRACKING FORM ... 12

Figure 1 Ongoing safety assessment process ... 6

Table 1 Ongoing safety assessment process summary ... 8
Table 2 Risk assessment matrix example ... 9

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1. SCOPE

This document describes a process that may be used to perform the ongoing safety assessment for (1) GAR aircraft and components (hereafter, aircraft), and (2) commercial operators of GAR aircraft. The process described herein is intended to support an overall safety management program. It is to help a company establish and meet its own internal standards. The process described herein identifies a systematic means, but not the only means, to assess continuing airworthiness.

Ongoing safety management is an activity dedicated to assuring that risk is identified and properly eliminated or controlled. The safety management process includes both safety assessment and economic decision-making. While economic decision-making (factors related to scheduling, parts, and cost) is an integral part of the safety management process, this document addresses only the ongoing safety assessment process. This ongoing safety assessment process includes safety problem identification and corrective action, tracking of problems, the application of “lessons learned” to improve the efficiency of the process, and reduction of the time to achieve corrective action in the field.

ARP5150 is the recommended practice for the safety assessment of Transport Airplanes in Commercial Service. ARP5151 is the recommended practice for the safety assessment process for GAR aircraft in commercial services. While the processes are similar, their implementations are different due to operations, data availability, and sizes of individual operations.

1.1 How to Use This Document

Each organization reviewing this document needs to establish which sections may prove helpful in improving or supplementing their existing safety related practices. The specific applicability and usefulness of the individual guidelines, methods, and tools will vary from organization to organization. Due to the wide variability in GAR manufacturers, aircraft maintainers/modifiers, vendors, users, and operators, this document provides a generic safety assessment process that may be tailored to fit a company’s specific situation.

1.2 Intended Users

The intended users of this document include, but are not limited to, GAR commercial operators, airframe/engine manufacturers, component manufacturers, equipment suppliers, maintenance/modification/repair centers, and airworthiness authorities. Any organization involved with the safety assessment and safety management of GAR aircraft or its components may be a potential user. Three specific levels of users have been defined. Those users have differing potential actions and types of information available thus their responses will vary. The three levels of users are:

Level A - Original Equipment Manufacturer (OEM) of the airframe, engine, or propeller. These organizations and others that hold a type certificate or production authorization have responsibility for their initial design and their changes to that design. These organizations also have a responsibility under 14 CFR 21.3 to report failures, malfunctions, and defects to the airworthiness authorities with the guidance of AC21-9B. Level A includes those organizations that did not produce the aircraft components (such as military surplus aircraft), but have a type certificate issued to them. Level A organizations have the responsibility for dissemination of corrective action, and may have worldwide service information on their products. This safety assessment process may be applied to Level A organizations’ products used in non-commercial service.

Level B - Component manufacturers, supplemental type certificate (STC), and part manufacturing approval (PMA) holders and technical standard order (TSO) holders of aircraft, engines, or equipment. These organizations have a responsibility under 14 CFR 21.3 to report failures, malfunctions, and defects to the airworthiness authorities with the guidance of AC21-9B. Repair stations have a responsibility under 14 CFR 145.221 to report failures, malfunctions, and defects to the airworthiness authorities. Level B organizations usually have database information that is limited to their own products or components, but are still responsible for identification of service issues and corrective action for their equipment. This safety assessment process may be applied to Level B organizations’ products/services used in non-commercial services.

Level C - Commercial GAR operators. These operators receive compensation for their aircraft services and have information limited to their internal operations. Level C organizations have internal corrective action responsibilities. Reporting of service and operational issues are usually initiated at the operator level. These organizations also have a responsibility under 14 CFR 135.415 to report to the airworthiness authorities, all failures, malfunctions, and defects related to their 14 CFR 135 operations. While it is recognized that some operations (e.g., use of an aircraft incidental to another type of operation) involve business or other types of use (e.g., 14 CFR 91 or equivalent), this safety assessment process is intended to apply to those aircraft, components, and operations used for compensation or hire which fall under 14 CFR 135.

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2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

ARP4754	Guideliens for Development of Civil Aircraft and Systems
ARP4761	Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment
ARP5150	Safety Assessment of Transport Airplanes in Commercial Service

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 Code of Federal Regulations (CFR)

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

14 CFR 21	Certification Procedures for Products and Parts
14 CFR 23	Airworthiness Standards: Normal Category Airplanes
14 CFR 25	Airworthiness Standards: Transport Category Airplanes
14 CFR 27	Airworthiness Standards: Normal Category Rotorcraft
14 CFR 29	Airworthiness Standards: Transport Category Rotorcraft
14 CFR 33	Airworthiness Standards: Aircraft Engines
14 CFR 35	Airworthiness Standards: Propellers
14 CFR 91	General Operating and Flight Rules
14 CFR 135	Air Taxi Operators and Commercial Operators
14 CFR 145	Repair Stations

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