Designation: F2295 – 10

Standard Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft[1]

This standard is issued under the fixed designation F2295; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice establishes the standard practice for the continued operational safety monitoring of a light sport aircraft.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F2245 Specification for Design and Performance of a Light Sport Airplane

F2564 Specification for Design and Performance of a Light Sport Glider

3. Terminology

3.1 *Definitions:*

3.1.1 *LSA airplane (light sport aircraft airplane)*—powered aircraft designed in accordance with Specification F2245 that is manufactured and delivered ready to fly.

3.1.2 *LSA glider (light sport aircraft glider)*—aircraft designed in accordance with Specification F2564 that is manufactured and delivered ready to fly.

3.1.3 *manufacturer*—any entity engaged in the production of an aircraft or component used on an aircraft.

3.2 *Acronyms:*

3.2.1 *LSA*—light sport aircraft

4. Significance and Use

4.1 The purpose of this practice is to establish a method by which safety of flight issues are discovered, evaluated, and corrected for the purpose of maintaining operational safety of a LSA.

5. Continued Airworthiness Support

5.1 The manufacturer of a LSA shall maintain an Operational Safety Monitoring System as a normal business conduct.

5.2 *Assignment Of Duties*—Manufacturers may assign operational safety monitoring and continued airworthiness support duties to other entities.

5.3 *Manufacturer's Responsibilities*—LSA manufacturers shall develop and implement a system of receiving, evaluating, and correcting safety of flight and service difficulty issues.

5.3.1 Manufacturer shall evaluate all safety of flight and service difficulty reports and shall initiate corrective action as needed to correct any safety of flight related issues.

5.3.2 Manufacturer shall not use notices of corrective action to promote or make mandatory non-safety of flight related equipment upgrades or additions.

5.3.3 The manufacturer shall provide with the delivery of each LSA documented continued airworthiness instructions in the English language. These instructions shall include at least the following:

5.3.3.1 A method for the owner/operator to report maintenance, service, and safety difficulties to the manufacturer, in accordance with 5.4.

5.3.3.2 A method for the owner/operator to obtain and verify that they have the latest safety of flight information developed by the manufacturer, in accordance with 5.4.

5.3.3.3 Instructions pertaining to annual and 100-h inspection items as needed.

5.4 *Owner/Operator Responsibilities:*

5.4.1 Each owner/operator of a LSA shall read and comply with the maintenance and continued airworthiness information and instructions provided by the manufacturer.

5.4.2 Each owner/operator of a LSA shall be responsible for providing the manufacturer with current contact information where the manufacturer may send the owner/operator supplemental notification bulletins.

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[1] This practice is under the jurisdiction of ASTM Committee F37 on Light Sport Aircraft and is the direct responsibility of Subcommittee F37.20 on Airplane.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

5.4.3 The owner/operator of a LSA shall be responsible for notifying the manufacturer of any safety of flight issue or significant service difficulty upon discovery.

5.4.4 The owner/operator of a LSA shall be responsible for complying with all manufacturer issued notices of corrective action and for complying with all applicable aviation authority regulations in regard to maintaining the airworthiness of the LSA.

5.4.5 An owner of a LSA shall ensure that any needed corrective action be completed as specified in a notice, or by the next scheduled annual inspection.

5.4.6 Should an owner/operator not comply with any mandatory service requirement, the LSA shall be considered not in compliance with applicable ASTM standards and may be subject to regulatory action by the presiding aviation authority.

6. Determination Of Corrective Action

6.1 The manufacturer of a LSA shall evaluate and determine appropriate corrective action for a safety of flight issue in accordance with Annex A1.

6.2 Manufacturer shall maintain a record of all safety of flight related risk assessments and the resolution thereof.

7. Notice Of Corrective Action

7.1 When corrective action is determined to be warranted (based upon the manufactures Operational Safety Risk Assessment Procedure as described in Section 6), the manufacturer shall issue a notice to the known owner/operators of the effected LSA's.

7.2 *Notices:*

7.2.1 Notices shall have a page header that contains the following information, when available:

7.2.1.1 The name, postal address, Web address, and telephone number of the issuing entity,

7.2.1.2 The date the notice is released,

7.2.1.3 The date the notice takes effect,

7.2.1.4 Limitations for completion of any required corrective action,

7.2.1.5 The make and model of the affected LSA,

7.2.1.6 The serial number of the affected LSA,

7.2.1.7 A number that uniquely identifies the notice,

7.2.1.8 The number of the superseded notice, if applicable, and

7.2.1.9 The page number and number of total pages.

7.2.2 The first page shall contain, in large bold uppercase letters, one of the following titles:

7.2.2.1 "SAFETY ALERT" for notifications that require immediate action.

7.2.2.2 "SERVICE BULLETIN" for notifications that do not require immediate action but do recommend future action.

7.2.2.3 "NOTIFICATION" for notifications that do not necessarily recommend future action but are primarily for promulgation of continued airworthiness information.

8. Discontinued Airworthiness Support

8.1 Should a manufacturer no longer be able to support the LSA produced, manufacturer should make a timely and diligent effort to contractually transfer any design data needed for continued airworthiness support to a viable entity, such as another manufacturer, type club, user group, or other interested party.

NOTE 1—This section shall not be construed as a requirement for a manufacturer to forfeit for any reason, any patents, copyrights, design ownership, commercial rights, proprietary information, intellectual property, monetary rights, or financial interests in the sale or transfer, or both, of any design data. Should a significant airworthiness issue arise that cannot be satisfactorily resolved, affected LSA's may be subject to regulatory action by the presiding aviation authority.

9. Keywords

9.1 airworthiness; light sport aircraft; sport pilot

ANNEX

(Mandatory Information)

A1. OPERATIONAL SAFETY RISK ASSESSMENT PROCEDURE

A1.1 Introduction

A1.1.1 This process of performing a risk assessment is for LSA manufacturers to use in order to determine appropriate corrective action on aircraft service difficulty or flight safety reports. Note that all operational situations are unique and that manufacturer experience or judgment may result in a different action taken than that prescribed by this procedure.

A1.1.2 Safety Alert notifications are required to address unsafe conditions, but the determination of which types of service problems should be considered as unsafe conditions is generally dependent upon the type and use of aircraft, and the effect a particular condition may have on the continued safe operation of the aircraft.

A1.2 Definitions

A1.2.1 *Safety Effect*—The actual service report or potential consequences of the service issue. The more adverse the consequences, the higher the risk weighting. The weighting for each safety effect is shown below:

A1.2.2 *Catastrophic Effect (4)*—High potential for loss of aircraft and fatalities.

A1.2.3 *Hazardous Effect (3)*—Large reduction in functional capabilities or safety margins that may cause serious or fatal injuries.

A1.2.4 *Major Effect (2)*—Significant reduction in functional capabilities or safety margins that may cause physical discomfort or a significant increase in workload, possible injuries, or fatalities.

A1.2.5 *Minor Effect (1)*—Slight reduction in functional capabilities or safety margins that may cause an increase in workload or require use of emergency procedures.

A1.2.6 *Operational Use*—Operational use may play a role in determining appropriate corrective action by impacting the priority in which the corrective action is accomplished.

A1.2.7 *Trainers*—Rigorous operational use demanded. Large number of takeoffs, landings, and power changes per flight hour tends to accelerate wear; accumulates hours quickly and is usually maintained under a structured maintenance program.

A1.2.8 *Personal Use*—Usually owned by individuals or small groups and generally operated for recreational purposes. Typically accrue low fleet average hours per month and are subject to annual condition inspection intervals. Low use often contributes to different airworthiness concerns than higher use aircraft.

A1.2.9 *Special Use*—Rentals, aerial advertising, aerial photography, and so forth may generate special concerns from this segment of operations.

A1.2.10 *Number of Occurrences of the Event*—An event is defined as a single service difficulty that requires an investigation to determine if a corrective action is necessary. The event may result in an aircraft accident, incident, a safety recommendation from the presiding civil aviation authority, a service report, and so forth. The number of occurrences is the total number of events of the same service difficulty across the fleet of specific make and model of aircraft.

A1.2.11 *Events versus Population*—The number of occurrences divided by the total number of aircraft of that make and model and configuration. Alternately, where a component is used in the same capacity on multiple makes or models, the number of occurrences divided by the total number of aircraft that incorporate the component.

A1.2.12 *Time Between Events*—Using all of the occurrences as defined above, determine the average time between events. For single events, use the average fleet age (in airframe hours) as the time between events.

A1.3 Risk Assessment Methodology

A1.3.1 Determine the safety effect and the Safety Risk Factor and plot the results of the assessment on the Risk Assessment Evaluation Chart using the methodology that follows. From the chart, determine the most appropriate method of alerting the public to the safety of flight issue or service difficulty (that is, Safety Alert notification, Service Bulletin, and so forth). The chart provides an objective method to assist the evaluator in determining the most appropriate corrective action.

A1.4 Risk Assessment Evaluation Chart

A1.4.1 The chart depicted in Fig. A1.1 is intended to serve as a basis for determining corrective actions. In certain cases, however, experience and judgment may drive the user to a different conclusion.

A1.4.2 The vertical axis denotes the safety effect and its effect on continued airworthiness. The four categories are minor, major, hazardous, and catastrophic. The categories are: intended to weigh the relative effects of an airworthiness problem and its effect on continued flight to landing. The user can interpolate and assess a safety effect score between the values stated below.

A1.4.3 The higher the Safety Effect, the more negative the airworthiness effect. The airworthiness impact determination is very important and must be carefully analyzed to ensure public safety while minimizing the economic burden of any necessary corrective action on the owners of an LSA.

A1.4.4 The horizontal axis denotes the Safety Risk Factor. The Safety Risk Factor increases from left to right and is calculated using the following:

A1.4.5 Safety Risk Factor = Safety Effect (a) × Operational Use (b) × Percentage Use by Population (c) + Number of Occurrences (d) + Events versus Population (e) + Time between events (f):

$$\text{Safety Risk Factor} = (a) \times (b) \times (c) + (d) + (e) + (f)$$

(a) = Safety Effect:
- Catastrophic = (4)
- Hazardous = (3)
- Major = (2)
- Minor = (1)

(b) = Operational Use:
- For hire = (2)
- Personal = (1)

(c) = Percentage Use by Population:
- >75 % For hire = (4)
- >50 % For hire = (3)
- >25 % For Hire = (2)
- <25 % For Hire = (1)

(d) = Number of Occurrences:
- 5+ = (3)
- 3 to 5 = (2)
- 1 to 3 = (1)

(e) = Events versus Population:
- 10 %+ = (2)
- 1 %+ = (1)
- 0.1 % = (0)
- Less than 0.1 % = (-1)

(f) = Time between Events:
- Over 3 years = (-1)
- Over 2 years = (0)
- 1 to 2 years = (1)
- Less than 1 year = (2)

A1.5 Safety Effect Determination

A1.5.1 The safety effect determination has a significant impact on the response to an airworthiness concern or service problem.

A1.5.2 The following list of safety of flight examples is broken down by the potential airworthiness impact. This is a guide, not a hard and fast rule or an exhaustive list. Manufacturers are encouraged to relocate, delete, or add, or a combination thereof, to the service issues listed within the examples

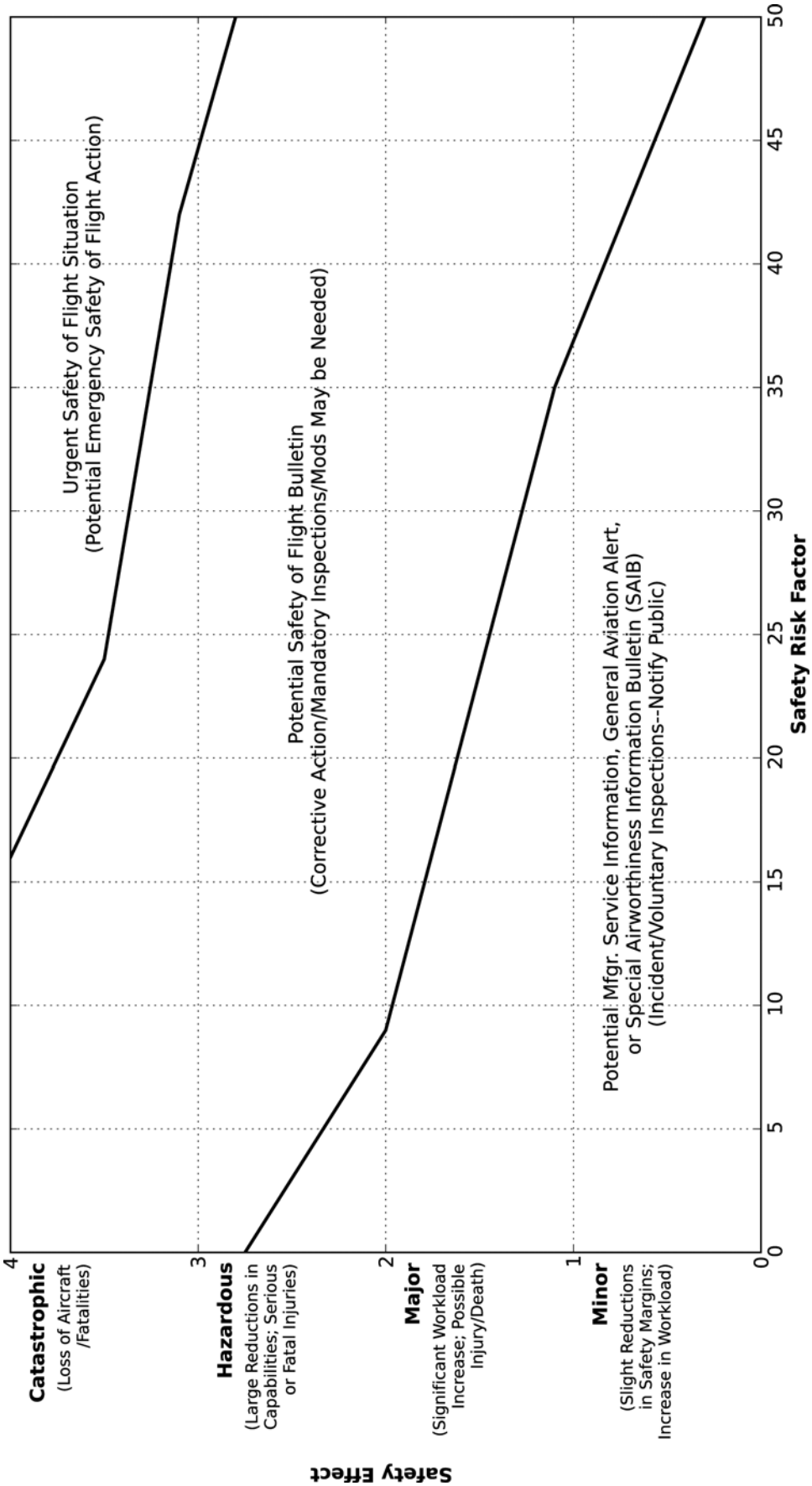

FIG. A1.1 Light Sport Aircraft Risk Assessment Evaluation Chart

below as necessary to address what constitutes a given level of safety effect appropriate to a specific aircraft configuration.

Examples of conditions with potentially CATASTROPHIC effect (4):
- Failure of primary aircraft structure
- Loss of primary control
- Failure of propeller blade
- Failure of propeller hub
- Engine fire that causes an accident
- Cabin fire
- Significant electrical system fire
- Structural, engine, or propeller repairs, or a combination thereof, performed incorrectly that result in a failure

Examples of conditions with potentially HAZARDOUS effect (3):
- Crack in primary structure (repairs required)
- Engine fire
- Carbon monoxide in cabin
- Total power loss
- Partial propeller blade failure
- Failure of pilot's seat

Examples of conditions with potentially MAJOR effect (2):
- Crack in primary structure (inspections required)
- Failure of primary engine fuel pump that results in aircraft damage
- Loss of ground steering
- Failure of engine coolant system
- Loss of trim control

Examples of conditions with potentially MINOR effect (1):
- Cracks in secondary aircraft structures
- Loss of primary engine fuel pump that does not cause engine failure, may cause performance degradation
- Failure of engine instruments including EGT/CHT, RPM, oil pressure, oil temperature, engine coolant indicator
- Total loss of braking
- Loss of trim position indicator
- Failure of stall warning