



U.S. Department
of Transportation
**Federal Aviation
Administration**

Small Airplane Directorate
901 Locust, Room 301
Kansas City, Missouri 64106

Thomas P. Turner
Manager of Technical Services
American Bonanza Society
P. O. Box 12888
Wichita, KS 67277

January 20, 2009

Subject: FAA Airworthiness Directive (AD) 2008-13-17

Reference: American Bonanza Society Letter dated October 31, 2008

Dear Mr. Turner:

In response to your letter, the Wichita Aircraft Certification Office (ACO) and the Small Airplane Directorate Standards Office both reviewed the data, documents, and processes leading up to issuance of AD 2008-13-17 in the areas you requested. We chose to have two offices review this information to assure that we considered background and history available in the ACO and also included an independent perspective from our standardization staff. The following response is based on this review by both offices and covers each item in your request.

Your letter requested our review of the subject AD in several specific areas:

1. Review the process that was used to dismiss all comments to the NPRM for AD 2008-13-17.

The Small Airplane Directorate has reviewed the process used to disposition comments to the NPRM for AD 2008-13-17. We also reviewed our application of the Airworthiness Concern Process (ACP) in this case, since it is an extended effort to obtain and consider public input when reviewing an airworthiness concern.

Regarding the AD process, we reviewed the procedures used to disposition comments provided to this NPRM. We found that public comments were reviewed and addressed in accordance with applicable processes, including Airworthiness Directive Manual (ADM) FAA-IR-M-8040.1B (FAA-AIR-M-8040.1). The FAA considered the comments provided by the public, stated whether or not they agreed with the comments, and provided "stated reasons" supporting their conclusions. We discuss technical aspects of these comment dispositions in more detail later in this response.

Additionally, the public comment period for Docket No. FAA-2007-28434 commenced on July 6, 2007, and ended on September 4, 2007. This comment period meets the standard period of 60 days as specified in the ADM.

In addition to the AD process, we also reviewed our application of the Airworthiness Concerns Process in this case. As you know, this process was developed in conjunction with type clubs and includes generation of an Airworthiness Concern Sheet (ACS) used to get public feedback on an airworthiness concern.

In evaluating the risk presented by the reported circuit breaker failures, the FAA Aviation Safety Engineers (ASE's) developed an ACS to obtain information from aircraft associations and type clubs. The ACS indicates that the Wichita Aircraft Certification Office (ACO) provided notice of the circuit breaker failures to the EAA, AOPA, type clubs, and other persons on October 1, 2004. On October 21, 2004, AOPA issued a letter to the Wichita ACO stating they had "no comments regarding this particular concern". Interviews with the FAA ASE's revealed that no other direct written communication was received from type clubs in response to the ACS.

After reviewing the process used to disposition comments to the NPRM for this AD, we found they complied with processes in our ADM. Specifically, comment disposition included proper consideration and disposition of public comments received. Technical details of these comment dispositions are discussed below. Additionally, our review showed that we properly applied our Airworthiness Concern Process in this case.

2. Re-review the comments filed by ABS, AOPA, and others during the NPRM comment period.

The Small Airplane Directorate re-reviewed the comments filed by ABS, AOPA, and others during the NPRM comment period. In very general terms, the commenters stated during the public comment period that:

- they needed more time to further investigate various issues such as circuit breaker switch replacements, Service Difficulty Reports, number of airplanes affected, and the availability of replacement parts
- the failures are uncommon and do not pose an imminent threat to the public
- the replacement of the switches is too costly
- testing or inspection to identify those circuit breakers affected would be a better approach.
- replacement parts are not readily available
- education in lieu of regulation would improve the level of safety
- emergency procedures should be considered in lieu of switch replacement
- only high electrical load items and Baron model aircraft be considered

These comments along with the documented responses were reviewed by our Small Airplane Directorate Standards Office and found to be appropriate and consistent with past practice. The following summarizes the determination of the independent review on each of the comments.

- Agreeing to delay issuance of the final rule in order to allow a search for additional SDRs would only serve to further validate the need for an AD where there already was sufficient Risk Factor and Safety Effect based on known service history. Regarding the availability of parts, as described in more detail below, we had information from the manufacturer indicating that parts would be available. If for any reason we had an issue with parts availability, or if other potential circuit breaker switch replacements were

identified, we could consider issuance of an alternative method of compliance (AMOC) to address the issue.

- With regard to the comments that the failures are uncommon and do not pose an imminent threat, the overheat failure of the circuit breakers can cause fire in the cockpit, smoke in the cockpit, and electronic malfunction. The determination made during AD development that failure of the circuit breakers could cause fire in the cockpit is supported by recent events. As recently as December 12, 2008, we became aware of a Service Difficulty Report (SDR) on a Hawker Beechcraft Model 58, serial number TH-216, which experienced a problem with circuit breaker switch part number 35-380132-7. The report states: “*ACFT enroute, when pilot smelled smoke and saw flames coming out of propeller heat circuit breaker switch.*” Whether an aircraft experienced a fire in the cockpit, smoke in the cockpit, or other electronic malfunction, any of these items could require emergency actions by the pilot. The FAA has issued ADs related to smoke, fire, and electrical malfunction on numerous prior occasions for various aircraft. The actions taken to address this safety issue are consistent with past FAA practice on similar issues. Risk factor calculations are discussed in more detail in a later section of this response.
- With regard to cost, the FAA did consider if there were other acceptable corrective actions with a lower cost; however, based on the unsafe condition in this case, there were none. This included consideration of information received by the FAA as a result of the NPRM comment period, and also the original ACS effort in 2004 (during which no substantive comments were received). Additionally, as stated on page 5 of the ADM, “...aircraft must conform to its type design and be in a condition for safe operation. The type design is approved only after the FAA makes a determination that it complies with all applicable airworthiness requirements. In adopting and maintaining those requirements, the FAA has already made the determination that they establish a level of safety that is cost beneficial. When the FAA makes a finding of an unsafe condition in an AD, it means that this cost-beneficial level of safety is no longer being achieved and that the required actions are necessary to restore that level of safety. Because this level of safety has already been determined to be cost beneficial and does not add an additional regulatory requirement, a full cost-benefit analysis for each AD would be redundant and unnecessary.”
- With regard to inspecting the switches to determine which ones needed to be replaced, the switches in question were all determined to be susceptible to the short-circuit overheating failure condition by design. Inspections could not be used to determine which parts will fail and which will not. The replacement circuit breaker switches are designed differently to prevent the short circuit.
- A review of the Hawker Beechcraft Corporation RAPID website shows existing inventory for all the required replacement parts. While they may not show immediate inventory to fulfill a total fleet replacement, it was explained in the original disposition of comments that Hawker Beechcraft “has assured us that the replacement parts are either available or could be manufactured within the 12-month compliance time.” This situation is not unusual or unique to this AD as in many cases there is lead-time involved for part replacement. As stated in the original comment response, “...we would consider extending the compliance time following the AMOC procedures...”

- The commenters suggested that education would be better to improve safety than regulation and that emergency procedures would suffice for those “uncommon” occasions when a switch might overheat. Burning smell or smoke is typically an indication of underlying fire. Fire in the cabin or significant electrical fire is classified as having potentially catastrophic effects according to our Airworthiness Concern Process. This could actually lead to a more conservative position being taken to address this safety issue. Indeed, the smell of smoke or burning could cause the pilot to interpret the situation as a fire. Turning off the master switch may cause the pilot to also lose equipment they require for safe landing. In addition, if the switches are not replaced, the pilot could potentially misinterpret the smell of burning to be related to these switches when it may be an entirely unrelated event.
- Finally, the commenters requested that the FAA only consider high electrical load items and Baron Models. The same switches are used in both Bonanza and Baron Models and there is no reason to believe the failure mode is limited only to high electrical load circuits or Baron Models.

3. Report to ABS the specific data and investigative processes used by the Wichita ACO to confirm or refute the viability of each comment filed.

The Small Airplane Directorate reviewed the specific data and investigative process used by the Wichita ACO to confirm or refute the viability of each comment. We found the following:

Specific Data:

When reviewing public comments, FAA ASE’s considered data gathered from service difficulty reports, analysis of affected circuit breaker toggle switches, and manufacturer’s service information. Specifically, this review included consideration of the risk evaluation done using the Airworthiness Concern Process. This process assigns values of risk relating to operational use, use by population, number of events, event vs. population, time between events, and aircraft type.

The Initial Safety Risk Factor Calculation included data contained in the Service Difficulty Reporting (SDR) database. For this condition, the safety effect was determined to be Hazardous due to the potential for fire and smoke in the cockpit. The output of the Safety Risk Calculation supported a determination that a “Potential Routine AD” was appropriate.

In this particular case, only SDR information available at the time was used in the risk analysis. Other events (such as the approximate 15 additional events mentioned by the American Bonanza Society) were not considered. Had the FAA ASE’s been able to include these other events, the Risk Factor would have increased showing a higher risk and perhaps indicating that more immediate action was required.

Investigative Processes Used:

As summarized previously, ASE’s used processes in accordance with our ADM and Airworthiness Concern Process when evaluating feedback from the public. Rational and

substantiated responses were based on data obtained using FAA and industry accepted processes in accordance with regulatory requirements in 14 CFR part 39. For this particular issue, none of the comments presented warranted any change to the AD.

4. Reconsider whether this costly and intrusive replacement requirement is necessary in light of actual data on the number and scope of incidents associated with circuit breaker overheats.

With regard to your request that the Small Airplane Directorate reconsider the actions taken to address this safety issue, we provide the following:

- The Small Airplane Directorate has re-examined concerns raised by the American Bonanza Society. We have described the actions taken to address your comments and indicated what data sources were used when determining the need for this AD action. In completing our review, we have found that the actions taken are consistent with established FAA procedures and sufficient justification exists supporting this AD action.
- The December 12, 2008, SDR report of flames coming out of a circuit breaker with a part number that is identified in this AD is indicative of the safety issue this AD action seeks to correct. This recent event further strengthens the FAA position on this issue.
- The FAA is always open to considering other specific alternative methods to address an unsafe condition and the current regulatory framework allows for persons to seek an AMOC. If you have information or alternative actions that you feel warrants consideration of an AMOC, please use the AMOC processes identified in 14 CFR 39.19 and the AD.

We hope that we have satisfactorily addressed all of your concerns on this issue. Additionally, we welcome the opportunity to foster continued collaboration on safety issues affecting the products served by ABS.

Sincerely,



Kim Smith
Manager, Small Airplane Directorate