Cessna Citation 500, VP-BGE	**2nm NNE of Biggin Hill Airport**	**30 March 2008**	**Accident**

Investigation Synopsis

Biggin Hill Airport notified the Air Accidents Investigation Branch (AAIB) of the accident on 30 March 2008 and the investigation began the same day.

The aircraft departed Biggin Hill for a private flight to Pau, France but shortly after takeoff initiated a return to Biggin Hill after reporting engine vibration. During the downwind leg for Runway 21, the aircraft descended. The flightcrew reported a major power problem just before it struck the side of a house. An intense fire developed. None of the two flight crew and three passengers survived.

The following contributory factors were identified:

1. It is probable that a mechanical failure within the air cycle machine caused the vibration which led to the crew attempting to return to the departure airfield.

2. A missing rivet head on the left engine fuel shut-off lever may have led to an inadvertent shutdown of that engine.

3. Approximately 70 seconds prior to impact, neither engine was producing any thrust.

4. A relight attempt on the second engine was probably started before the relit first engine had reached idle speed, resulting in insufficient time for enough thrust to be developed to arrest the aircraft's rate of descent before ground impact.

Three Safety Recommendations have been made.

Safety Recommendation 2010-014

Safety Recommendation 2010-014

It is recommended that the Federal Aviation Administration require that Cessna Aircraft Inc introduce a scheduled inspection of the Cessna Citation 1 throttle quadrant assembly to ensure the integrity of the riveted joints securing the fuel shut-off levers to the throttle levers.

Date Safety Recommendation made: 13 May 2010

LATEST RESPONSE

Response received: 02 August 2021

A maintenance inspector assigned to the Kansas City Aircraft Evaluation Group (MKC AEG) contacted the Airworthiness Manager from Cessna Aircraft Company to discuss this recommendation. Cessna provided documentation stating there is no specific inspection of the individual rivets attaching idle cutoff lever. However, the idle levers are inspected during the Phase 5 inspection of the General Pedestal Area, which occurs every 1200 hours or 36 months, whichever occurs first.

The AEG reviewed the maintenance manual and confirmed that a general visual inspection for the identified rivet joint area is called out in two areas in the maintenance manual.

AFS-300, as well as the MKC AEG, believes with the verification that an inspection of the area is required at the Phase 5 inspection, additional scheduled inspections are not necessary. We therefore consider this recommendation closed and no further action is planned

Safety Recommendation Status **Closed**

AAIB Assessment **Not Adequate**

RESPONSE HISTORY

Response received: 11 September 2010

We have requested that the Kansas City Aircraft Evaluation Group (MKC-AEG) investigate the area discussed by this recommendation, review the appropriateness of implementing this recommendation, and respond to our office by September 14, 2010. We have not yet received a response from MKC-AEG.

We are requesting a 90-day extension and will provide you our response to FAA Safety Recommendation 10.134, by January 17, 2011.

AAIB Assessment – Not Adequate Open

Response received: 08 September 2010

We have requested the Kansas City Aircraft Evaluation Group (MKC AEG) to investigate the area discussed by this recommendation, review the appropriateness of implementing this recommendation, and respond to our office by September 10, 2010.

We will provide you our response to FAA Safety Recommendations 10.134 by September 14, 2010.

AAIB Assessment – Not Adequate Open

(SRIS Reference: GB.SIA-2010-0014)

Safety Recommendation 2010-015

Safety Recommendation 2010-015

It is recommended that the Federal Aviation Administration require Cessna Aircraft Inc to amend the 'EMERGENCY RESTART –TWO ENGINE' checklist to emphasise the significance of only restarting one engine at a time.

Date Safety Recommendation made: 13 May 2010

LATEST RESPONSE

Response received: 14 August 2012

We completed our assessment and found the existing AFM procedures for emergency engine restart acceptable as written. It does not constitute an unsafe condition.

We worked with Cessna Aircraft Company, reviewed the affected flight manuals stating 'Either Start Button - Press Momentarily' clearly directs the crew to attempt the start of just one engine at a time. This is reinforced through type rating training covering abnormal start procedures as well as the normal start procedure for starting engines on the ground. The Cessna flight manual is consistent in the use of the word 'Either' during both normal and emergency engine starting procedures to indicate each engine should be started individually. While it is plausible that the accident crew attempted to start the second engine before the first start attempt was completed, the data presented in the accident report does not definitively support this action by the crew. It is unclear that the double engine relight performance presented from an engine test cell directly correlates to the restart performance of a windmilling engine.

We reviewed the AFM procedures for other models in the same catefory and age as the Cessna 500. For those AFMs with double engine relight procedures, none specifically discuss potential starter cutout if both are selected at the same time. Our review of the service history on these aircraft does not indicate a safety concern. Based on the lack of additional details form the accident aircraft, we concluded that there is not adequate evidence to justify mandatory modification of the Cessna 500 AFM as proposed.

As noted in our previous safety recommendation response to this recommendation, we reviewed service data for any similar occurrences and found no incidents, accidents, or reports of such an event. We believe we have effectively addressed FAA Recommendation 10.135 and consider our actions complete.

Safety Recommendation Status **Closed**

AAIB Assessment **Not Adequate**

RESPONSE HISTORY

Response received: 28 June 2012

The FAA conducted an evaluation of the issue and reviewed the affected flight manuals. We concluded that while the statement used in the Citation Model 500 manual and other Citation manuals ("Either Start Button - Press Momentarily") accurately conveys that the crew should attempt to stmi only one engine at a time, we are continuing to work with Cessna to determine if additional enhancements would be beneficial.

We expect to provide an update on our progress by March 31, 2013.

AAIB Assessment – Not Adequate Open

Response received: 01 November 2011

We worked with Cessna Aircraft Company to thoroughly review and critically evaluate the wording used in the affected manuals.

We determined the Emergency Procedures -"EMERGENCY RESTART - TWO ENGINES" procedure is consistent across all models.

In Cessna's procedures for the dual engine failure case, the first action is to attempt to windmill start the engines simultaneously. If that is unsuccessful, starter assist is employed one engine at a time (EITHER). If the first engine start is unsuccessful, it is expected that the crew will execute the "FALSE ENGINE START" procedure and terminate the attempted start prior to initiating the start on the second engine. The starter will continue to run until either a successful engine start is accomplished or the crew manually disengages the starter. Basic pilot knowledge is to start one engine at a time. We believe term "EITHER" is adequate to describe the condition of starting one engine at a time unless instructed otherwise.

It is possible to press both engine "START" switches simultaneously, which would lead to a significant battery voltage loss as electrical power would be provided to both the starters and the entire electrical buss. We do not believe this is a likely scenario.

Selecting the second engine starter before the first engine start was complete would not terminate the first engine start or affect the time to start. The first engine start would continue unless the engine was damaged or the start was manually terminated. With both engines wind milling, the inertia to start plus positive pressure on the inlet greatly reduces the torque required to spin the engines. The starters, batteries and electrical system are sized to start an engine on the ground with zero rotation on a cold day (-20C). Selecting both starters while in-flight with the engines wind milling would likely result in less electrical load than a cold start for a single engine. We believe both engines would proceed through their normal start sequence.

We plan to monitor for any additional occurrences and respond again in February 2012.

AAIB Assessment – Not Adequate Open

Response received: 16 July 2010

We have shared this recommendation with the Cessna Aircraft Company and are investigating the issue and developing an appropriate course of action.

We anticipate submitting our follow-on response by December 2010.

AAIB Assessment – Not Adequate Open

(SRIS Reference: GB.SIA-2010-0015)

Safety Recommendation 2010-016

Safety Recommendation 2010-016

It is recommended that the International Civil Aviation Organisation adopt the proposals of its Flight Recorder Panel for the requirement to install flight recorders on turbine-engine powered aeroplanes of a maximum certified takeoff mass of 5,700 kg or less.

Date Safety Recommendation made: 13 May 2010

LATEST RESPONSE

Response received: 23 July 2019

This email refers to your email dated 5 July 2019, related to AAIB Safety Recommendation 2010-016 – VP-BGE originating from the accident of a Cessna Citation 500, registration VP-BGE, 2 nm NNE of Biggin Hill Airport, United Kingdom on 30 March 2008. The safety recommendation recommended as follows:

It is recommended that the International Civil Aviation Organization adopt the proposals of its Flight Recorder Panel for the requirement to install flight recorders on turbine-engine powered aeroplanes of a maximum certified takeoff mass of 5 700kg or less. Safety recommendation: 2010-016

AIG do not find records of a formal response to the AAIB, however the proposals referred to in the safety recommendation have been adopted by the ICAO Council on 26 February 2010 and these provisions became applicable in Annex 6 – Operation of Aircraft, Parts I – International Commercial Air Transport – Aeroplanes (Amendment 34) and II – International General Aviation - Aeroplanes (Amendment 29) on or after 1 January 2016.

Safety Recommendation Status **Closed**

AAIB Assessment **Adequate**

RESPONSE HISTORY

N/A

(SRIS Reference: GB.SIA-2010-0016)