

INCIDENT

Aircraft Type and Registration:	Airbus A320-214, G-EZOZ	
No & Type of Engines:	2 CFM CFM56-5B4/3 turbofan engines	
Year of Manufacture:	2015 (Serial no: 6918)	
Date & Time (UTC):	24 June 2018 at 1900 hrs	
Location:	On departure from Liverpool John Lennon Airport	
Type of Flight:	Commercial Air Transport (Passenger)	
Persons on Board:	Crew - 6	Passengers - 179
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	33 years	
Commander's Flying Experience:	6,086 hours (of which 5,914 were on type) Last 90 days - 165 hours Last 28 days - 59 hours	
Information Source:	Aircraft Accident Report Form submitted by the commander and the Operator's Report	

Synopsis

After takeoff the commander inadvertently selected the flaps up instead of the landing gear. The flight crew quickly realised the error, returned the flaps to the takeoff setting and focused on flying the aircraft to achieve a safe flight path. It was not possible to determine why the inadvertent selection occurred.

History of the flight

The crew reported at Liverpool John Lennon Airport at 1050 hrs for a four sector day; the first two sectors were to and from Madrid Barajas International Airport. On the second sector a bird strike occurred on takeoff from Madrid; no damage was found and the flight continued without further incident.

The third sector was from Liverpool to Paris Charles de Gaulle airport. Weather conditions were CAVOK and the co-pilot was the pilot flying. Takeoff was planned from Runway 27 with Configuration 1+F¹ and an aircraft gross weight of 62.6 tonnes. The takeoff roll was normal. The commander reported that after lift-off the co-pilot called for "gear up"; the commander replied "gear" but inadvertently placed her hand on the flap lever instead of the landing gear lever and selected FLAP 0. She realised the error and moved the flap lever

Footnote

¹ Config 1+F - leading edge slats extended to 18° and trailing edge flaps extended to 10°.

back to the FLAP 1 position, whereby the slats remained extended but the flaps continued to retract.

The co-pilot recalled hearing the commander call “gear” and looking at the gear lever but not seeing the commander’s hand on the lever. However, by this time the flap lever had already been moved and returned. Both pilots reported that, realising what had happened, they focused on flying the aircraft. They reduced the pitch attitude to accelerate and, maintaining a positive rate of climb, retracted the landing gear. They considered using TOGA² thrust but decided this was not necessary. Throughout the incident the airspeed remained above V_{LS} ³. Once the aircraft was stabilised, the autopilot was engaged and the slats were retracted. The flight continued without further incident.

After the incident neither pilot could identify any reason why the slip had occurred. They were not aware of any distraction and did not report feeling fatigued.

Recorded information

The aircraft FDR and CVR were not downloaded. The operator provided the AAIB with the QAR⁴ data.

The data showed that on takeoff, passing 181 ft radar altitude (radalt) and at 162 kt, the flap and slat angle started to reduce. The slat angle reduced slightly from 18° to 17.2° but then returned to 18°. The flap angle continued to retract to 0°. No movement of the flap lever was recorded. However, flap lever position is only recorded every two seconds, so it is likely that the lever was moved and returned in less than this time.

Passing 330 ft radalt the landing gear was selected UP.

Climbing through 600 ft radalt, pitch angle was reduced to 10° and the airspeed started to increase. Passing 800 ft radalt, speed had increased to 185 kt and the pitch angle was increased to 15°.

Passing 1,350ft radalt the thrust levers were retarded to climb power and the pitch attitude reduced to 10°. Flap 0 was selected passing 1,650 ft as speed increased through 200 kt. By 2,000 ft radalt the slats had fully retracted.

Previous events

The AAIB reported on four similar flap mis-selection incidents in Bulletins 9/2017 (G-EZEZ and G-EZWM) and 8/2016 (G-EZFA and G-EZTZ).

Footnote

² TOGA - Takeoff/Go-around (thrust).

³ V_{LS} – the lowest selectable speed, represented by the top of the amber strip along the airspeed scale on the primary flight display.

⁴ Quick Access Recorder.

Aircraft information

Flap system logic

When the flap lever is moved to position 0 from CONFIG 1+F after takeoff, the flaps and slats begin retracting at the same time if the airspeed is above 148 kt. In flight, when the airspeed is above 100 kt, moving the flap lever from position 0 to 1 commands CONFIG 1 rather than CONFIG 1+F, extending the slats but not the flaps. If, after takeoff (and above 100 kt), the flap lever is moved from position 1 to 0 and then back to 1, the slats and flaps begin to retract but, although the slats will extend again, the flaps will continue to retract.

Operator's standard procedures

Following the previous incidents, the operator modified its standard operating procedures (SOPs) for selection of landing gear and flaps. The change introduced a pause before the selector of the landing gear or flap. The operator's change notification highlighted that the pause was introduced 'so that the PM cognitively confirms the proper lever has been selected' and 'allows PF to intervene if he or she notices an incorrect selection is about to be made'. The modified SOPs are shown in Figure 1.

2.3.90.6 Flaps Callout

Flaps Configuration	Callout
1	Flaps One
1 + F	Flaps One
0	Flaps Zero

The reply will be given when selecting the new flaps position. For example

	Callout	Remark
PF	"FLAPS ONE"	PF commands Flaps 1
PM	"SPEED CHECKED"	PM checks that the speed is: <ul style="list-style-type: none"> • Above F or S speed and accelerating (Takeoff/Go-around). • Below VFE NEXT and decelerating (Approach).
	"FLAPS"	To reduce inadvertent FLAPS selection, the PM places their hand on the FLAPS lever calls "FLAPS".
	"ONE"	PM selects the commanded position and calls the Flaps position by checking the blue number on the ECAM Flaps indicator to confirm the correct selection has been made.

2.3.90.7 Gear Callout

	Callout	Remark
PF	"GEAR UP (DOWN)"	PF commands Gear Up (Down) having checked that the speed is within placard limits.
PM	"GEAR"	PM checks that the speed is appropriate.
	"UP (DOWN)"	To reduce inadvertent L/G selection, the PM places their hand on the L/G lever, calls "GEAR". PM then states "UP" or "DOWN" and selects the commanded position.

Note: Crews are required to check the speed is within the Landing Gear operating limits before operating the Landing gear, this check can be silent.

Figure 1

Operator's SOPs for landing gear and flap selection

Operator's report on the incident

The operator's report stated:

'The flap retraction by the Captain was a 'selection error'. This is a type of 'action slip', where an out-of-sequence step (the flap selection) is included in a series of routine, well-learned behaviours (take-off procedure). Action slips are related to variability of sensorimotor coordination, sometimes called 'motor memory'. Action slips are hard to detect as the action itself is not under conscious control from a human information processing perspective. Based on FRMS [Fatigue Risk Management System] analysis fatigue is not considered a contributory factor. It was not possible.'

The report highlighted that the crew rapidly recognised the mis-selection and responded promptly to ensure a safe flight path in accordance with the operator's upset recovery training.

The operator reviewed the five safety actions that were taken following the previous incidents (Table 1).

Previous Safety Action	Review
It reviewed its current training and guidance to support crews in handling the aircraft in a low energy state at low altitude.	Following a review, training was provided to all pilots over two recurrent simulator checks.
Crews would be trained in 'active monitoring', focussing on switch selections and lever movements.	'Active monitoring' has featured in all recurrent checks since 2016 both as a briefing topic and as a key performance indicator.
It amended its SOPs for flap and landing gear selection to ensure the correct lever is identified before being moved.	SoPs for flap and gear selection were changed to establish a pause prior to selection of the lever.
It would develop training to help crews manage distractions (which had played a role in some events).	The issue of distraction has been addressed through 'active monitoring' training and enhanced briefing techniques focusing on 'how' the aircraft will be operated.
It would raise awareness amongst pilots of the events reviewed through a dedicated flight safety communication.	Two articles were published in the operator's flight safety bulletin.

Table 1

Operators previous safety action and review following this event

Analysis

After takeoff, the commander inadvertently selected the flaps up instead of the landing gear. The error was quickly recognised, the flap lever was returned to the FLAP 1 position and the flight crew focused on achieving a safe flight path in accordance with the operator's upset recovery training.

It was not possible to identify a definitive reason why the inadvertent selection occurred.

Following the incident, the commander stated that in future she will employ a longer pause to double check the correct lever selection and allow time for the pilot flying to intervene should they see the wrong lever has been selected.

The operator reviewed the action taken following previous events which highlighted that the training provided to manage the aircraft in a low energy state at low altitude had been effective in this incident.