

SERIOUS INCIDENT

Aircraft Type and Registration:	DHC-8-402 Dash 8, G-PRPH
No & Type of Engines:	2 Pratt & Whitney Canada PW150A turboprop engines
Year of Manufacture:	2010 (Serial no: 4323)
Date & Time (UTC):	10 January 2020 at 1956 hrs
Location:	Leeds Bradford Airport
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 4 Passengers - 51
Injuries:	Crew - None Passengers - None
Nature of Damage:	None reported
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	49 years
Commander's Flying Experience:	10,541 hours (of which 10,163 were on type) Last 90 days - 187 hours Last 28 days - 28 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

After a normal engine start the Auxiliary Power Unit (APU) was switched off, however the 'APU STARTER' light illuminated. The aircraft systems were shut down and a re-start attempted using a ground power unit. During this time smoke was seen emanating from the rear of the aircraft so the crew initiated a rapid passenger disembarkation. Examination of the aircraft found that the APU starter/generator had overheated probably as a result of an APU contactor failure.

History of the flight

The aircraft was completing a normal turnaround at Leeds/Bradford Airport with the Auxiliary Power Unit (APU) running. Approximately 5 minutes before pushback a strong smell, described by the crew to be like a burning clutch, was apparent in the flight deck and the front of the cabin. The captain asked the dispatcher to check the rear of the aircraft for evidence of anything unusual and nothing was found. The smell cleared within 10 to 15 seconds and was considered to have been associated with a truck which had passed the aircraft around that time.

The aircraft pushed back at 1956 hrs and successfully started the right engine in preparation for a single engine taxi. Once the engine had started and all electrical systems were powered, the APU was switched off. During the subsequent 'AFTER START' checks it

was identified that the starter light had illuminated on the APU panel, even though all the switches were in the OFF position.

The captain immediately referred to the Quick Reference Handbook for '*APU STARTER FAILURE*' drills. As he went through the drills other caution lights began to appear on the primary flight displays, the engine display and the central warning panel, with the APU starter light remaining illuminated throughout. The aircraft and engine were therefore shut down. The captain then contacted maintenance control who suggested re-setting the system using a ground power unit (GPU). This was called for and when it arrived the captain requested that the senior cabin crew member (SCCM) open the forward left door. This would then allow communication with the ground crew from the flight deck if electrical power was lost.

After the GPU was connected and operating correctly, the aircraft batteries were turned back on. After about 5 seconds the batteries began to discharge rapidly and three display screens on the flight deck went blank, however the APU starter light remained illuminated. The captain informed maintenance control that he intended to completely shut down the aircraft. As he was having this discussion, the ground crew informed the flight crew that smoke was rising from the tail of the aircraft. ATC was informed and the fire crews were called. There was no smoke reported in the cabin or flight deck, however the fire crews, after arriving at the aircraft, saw smoke rising from its rear and recommended via ATC that a controlled evacuation be initiated.

The captain switched off the battery master switch and gave the order to the SCCM to initiate a rapid disembarkation. As the aircraft systems had been shut down, this was done without use of the PA. The passengers left the aircraft via the forward left door quickly and orderly, leaving their belongings behind.

Aircraft examination

Examination of the aircraft by engineering staff from a Part 145 maintenance organisation at the airport identified that APU starter/generator showed signs of heat damage. The starter/generator and the K26 contactor, which connects the starter/generator to the right main bus, were replaced and the aircraft returned to service.

Discussion

The cause of the failure was not determined but the description of the event and experience highlighted by the aircraft manufacturer suggests that the main contacts within the K26 contactor may have welded themselves together. This would have resulted in the starter/generator remaining powered whenever the right main bus was live.

With this known problem, the manufacturer has introduced a procedure to inspect the main surfaces of the contacts within the contactor at every C check. An assessment of the aircraft's maintenance records was not possible and therefore it could not be determined whether the contacts had been checked during G-PRPH's last C check.