Safety Regulation Group
Safety Investigation and Data Department

Follow-up Action on Occurrence Report

ACCIDENT TO AGUSTA A109E, G-DPPH, AT CROSS HANDS, WALES ON 25 DECEMBER 2001

(HELICOPTER FORCE LANDED AFTER DOUBLE ENGINE FAILURE DUE TO FUEL STARVATION)

CAA FACTOR NUMBER	:	F4/2003
FACTOR PUBLICATION DATE	:	12 March 2003
OPERATOR	:	Dyfed-Powys Police
CAA OCCURRENCE NUMBER	:	2001/08528
AAIB REPORT	:	Bulletin 2/2003

SYNOPSIS

(From AAIB Report)

The helicopter was not flown on 24 December. When the same pilot commenced duty on Tuesday 25 December, he carried out the normal pre-flight duties and inspections but did not consult the emergency checklist, having done so the day before. The total fuel on board the aircraft was 340 kg of which 150 kg were used during a one hour flight in the late morning. The aircraft would normally have been refuelled to the standard operating fuel load of 400 kg but, given the request for minimum fuel for the pump change, a fuel remaining weight of 190 kg was considered acceptable because more fuel could have been loaded if the next task had required it.

That afternoon the aircraft was tasked to move a patient from a nearby landing site to Morriston hospital. The pilot estimated that the total flight time would be 30 minutes and with an hourly fuel burn rate for planning purposes of 200 kg, the 190 kg of fuel remaining was adequate. Flight time to the site was 18 minutes and the helicopter departed the site for the hospital with 143 kg remaining arriving 6 minutes later. Having shut down and offloaded the patient, the aircraft subsequently lifted off with 115 kg of fuel for the 10 minute flight back to the operating base. Given the caution of increased unusable fuel of 20 kg contained on page 43 of the Emergency Checklist, and the estimated fuel required of 40 kg for the short transit back to base, the pilot considered that adequate fuel was available.

Shortly after departing the hospital, the aircraft encountered a line of heavy snow showers across the track to the operating base. The pilot established that the snow had passed over their destination, which was reported as being in sunshine. He explained to the two passengers that 96 kg of fuel remained which he calculated was enough for 30 minutes of flight at reduced power. Their base at that point was about four minutes flight away at the normal cruise speed of 130 KIAS. The pilot informed his passengers that he intended to fly through the band of snow provided that adequate visibility could be maintained. He descended the aircraft to a height of 400 feet agl and reduced the airspeed to 80 KIAS in order to retain good visual contact with his main reference feature, which was a dual carriageway.

After the aircraft entered the snow shower, the 'FUEL PUMP 2' caption on the EDU began to flicker and then remained on. The pilot considered that the No 2 fuel booster pump had also failed and informed the passengers that they would continue the short distance to the operating base. He explained that the engine driven pumps had sufficient suction to draw fuel from the tanks and thereby maintain an adequate fuel supply to the engines. A few

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seconds later both engines ran down and the rotor RPM decayed. The pilot realised he had suffered a double engine failure and lowered the collective pitch lever in order to try and restore the rotor RPM. He warned the passengers that they would make an emergency landing and saw a clear field ahead, selected the landing gear down and started to transmit a MAYDAY distress call. Near the ground he flared the aircraft and raised the collective pitch lever in order to cushion the touchdown but this appeared to have little effect. The aircraft landed heavily with low forward speed but with a high rate of descent. It remained upright, the tail boom having detached and the main and tail rotor blades suffered major damage.

FOLLOW UP ACTION

The two Safety Recommendations, made by the AAIB following their investigation, are reproduced below, together with the CAA's responses.

Recommendation 2002-36

The UK Civil Aviation Authority should require helicopter AOC holder's Minimum Equipment Lists to state the relevant actions and procedures for dispatching an aircraft with any unserviceable item which may have a significant impact on subsequent safe operation of the aircraft.

CAA Response

The CAA accepts this Recommendation.

It is the view of the UK Civil Aviation Authority (CAA) that this Safety Recommendation relates to the Maintenance and Operational Procedures identified by the Manufacturer during the aircraft certification and contained within the Master Minimum Equipment List.

The CAA will require that all UK AOC holders, of fixed and rotary wing aircraft, publish the Operational and Maintenance Procedures referenced in the Master Minimum Equipment List (MMEL) as a part of the operator's manual or in their Minimum Equipment List (MEL).

JAR-OPS 1/3.030 and JAR-MMEL/MEL.075 already require that Operational and Maintenance procedures referenced in the MMEL are published as part of the operator's MEL or the operator's manual. This requirement is not specifically referred to in CAP 549. UK AOC holders of MELs produced in accordance with CAP 549 will therefore be notified of this requirement by means of a Flight Operations Department Communication (FODCOM) which will be published by 31 March 2003.

The CAA will subsequently revise CAP 549 to ensure that the requirements contained in JAR-MMEL/MEL.075 are followed when MELs are produced by operators in accordance with Article 16 of the Air Navigation Order 2000 and CAP 549.

In the case of the aircraft involved in this accident, the above requirement would not have resulted in an Operational ('O') Procedure being contained in the MEL as the source document, an FAA Approved MMEL, does not list an 'O' procedure as being required for this unservicability. The CAA will bring this Safety Recommendation to the attention of the FAA, requesting that they consider requiring an amendment to the approved MMEL to be made to introduce an 'O' procedure for this unservicability.

CAA Status - Open

Recommendation 2002-37

The UK Civil Aviation Authority, in conjunction with the Italian Ente Nazionale per l'Aviazione Civile, should revise the layout of the Agusta 109 Rotorcraft Flight Manual Emergency and Malfunction Procedures pages so that:

a. The caution message contained in the Failure of fuel pump 1(2) reference on page 3-10 of the Rotorcraft Flight Manual is repeated in the itemised Failure of fuel pump 1 (2) drill on pages 3-55 A and 3-55B of the Rotorcraft Flight Manual.

b. Either the continuation of any drill onto the next page should be clearly indicated or the completion of each drill should be clearly indicated.

CAA Response

The CAA does not accept this Recommendation.

With regard to part (a.) of this Recommendation, the Flight Manual procedure for handling the malfunction of a fuel pump requires the fuel crossfeed valve to be closed. The caution in question is related only to the crossfeed 'open' configuration which is an intermediate condition only. To repeat the caution within the same procedure is considered unnecessary and may lead to confusion and misidentification of the correct value of unusable fuel.

With regard to part (b.) of this Recommendation, the drills in this Manual begin with a highlighted title and clearly come to an end only when the next highlighted title is encountered. This is the format throughout the RFM and is in common use in other RFMs.

However the CAA acknowledges that emergency or malfunction checklists provided for use in the cockpit could, on occasion, be improved by ensuring there is a clear indication when a drill is carried over to another page. The operator normally produces the checklists used in public transport aircraft. They are based on the Flight Manual checklists but modified to include operating, legislative and equipment considerations and should be produced with human factor design principles in mind. Therefore the CAA will publish a Flight Operations Department Communication in April 2003 to remind all operators that Human Factors principles should be observed when producing Operations Manual Emergency or Malfunction Check Lists, This should include the use of a term such as 'continued over' where appropriate.

CAA Status - Closed