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# AAIB Bulletin S1/2014 SPECIAL

ACCIDENT			
Aircraft Type and Registration:	AS332 L2 Super Puma, G-WNSB		
No & Type of Engines:	2 Turbomeca Makila 1A2 turboshaft engines		
Year of Manufacture:	2002 (Serial no: 2582)		
Location:	Approximately 1.5 nm west of Sumburgh Airport, Shetland Islands		
Date & Time (UTC):	23 August 2013 at 1717 hrs		
Type of Flight:	Commercial Air Transport (Passenger)		
Persons on Board:	Crew - 2	Passengers -	16
Injuries:	Crew - 1 (Serious)	Passengers -	4 (Fatal) 3 (Serious)
Nature of Damage:	Helicopter destroyed		
Commander's Licence:	Airline Transport Pilot's Licence (Helicopters)		
Commander's Age:	51 years		
Commander's Flying Experience:	10,504 hours (of which 1,515 were on type)		
Information Source:	AAIB Field Investigation		

## Introduction

At 1717 hrs UTC on 23 August 2013, an AS332 L2 Super Puma helicopter, with 18 persons on board, crashed into the sea whilst on approach to Sumburgh Airport in the Shetland Islands. Four of the passengers did not survive.

AAIB Special Bulletins S6/2013 and S7/2013 were published to provide initial information on the circumstances of the accident. This Special Bulletin is published to highlight a safety concern relating to pre-flight safety briefings, given to passengers, on the functionality of emergency equipment provided to them for UK North Sea offshore helicopter flights.

This Special Bulletin contains facts which have been determined up to the time of issue. It is published to inform the aviation industry and the public of the general circumstances of accidents and serious incidents and should be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

#### Emergency breathing systems

Research<sup>1</sup> has identified that in about 60% of all helicopter water impacts, the helicopter inverted or sank, immediately or after a short delay. A capsize often occurred before evacuation of the occupants could be completed. As a result, Emergency Breathing Systems (EBS) were developed to allow helicopter occupants to breathe underwater for a short period of time. The EBS can bridge the gap between the maximum breath-hold time of an occupant and the time required to complete an underwater escape, thereby increasing the chances of survival. EBS were introduced in UK North Sea offshore helicopter operations as a voluntary industry standard; at present there is no regulatory requirement for such equipment.

Three types of EBS are currently in use:

- Compressed air systems, which are similar in design to a small 'Self Contained Underwater Breathing Apparatus' (SCUBA) cylinder, with mouthpiece.
- Rebreather systems, which allow the user to rebreathe the air contained in their lungs by expelling a breath into a bag prior to entering the water. The wearer can then breathe this air for a limited period.
- Hybrid systems, consisting of a rebreather system with a cylinder of compressed gas that provides a small initial inflation charge of air into the bag, that can be supplemented with the user's breath. Release of air from the cylinder to inflate the rebreather bag is automatically triggered when the system is submerged in water. This allows the user to breathe even if they have not taken a breath prior to submersion.

One example of a hybrid system is the Lifejacket Airpocket Plus (LAP) combined lifejacket and hybrid rebreather. This particular model of EBS has been widely adopted for use by operators of UK North Sea offshore helicopter flights and is routinely provided to passengers.

### Passenger briefing material

Offshore helicopter passengers must complete initial and recurrent training which reportedly details the operation of the EBS and that it can be used without an initial input breath. Audio/visual DVD-based pre-flight safety briefings are also given prior to every flight. The briefings cover the donning and use of the various items of survival equipment, including the EBS, where applicable.

The pre-flight safety briefing material has been reviewed by the AAIB as part of its ongoing investigation. This has identified that the briefing material does not include fully representative information about the EBS. It does not highlight that the EBS provided may be a hybrid rebreather containing an air supply which is discharged automatically into the rebreather bag, or that the system can be used even if the wearer has not taken a breath before becoming submerged.

#### Footnote

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<sup>&</sup>lt;sup>1</sup> Rice and Greer, 1973; Hayes, 1991; Brooks, 1989; Clifford, 1996.

Incomplete information in the pre-flight safety briefing material may give passengers the false impression that hybrid rebreathers such as the widely used LAP system are only of benefit if the user has taken a breath prior to becoming submerged. Knowledge that hybrid rebreathers contain their own supply of air may therefore influence a passenger's decision on whether or not to use the EBS in an emergency situation.

#### Safety action

The AAIB has approached the main helicopter operators flying in support of the UK oil and gas industry, whose passengers are equipped with a hybrid EBS. Whilst operation of the hybrid EBS should be covered in initial and recurrent training, it is not explicitly described in the pre-flight safety briefing. The operators have undertaken to amend their pre-flight briefing material to include information that the hybrid system contains its own air supply which is discharged automatically, making the system usable even if the wearer has not taken a breath before becoming submerged.

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AAIB investigations are conducted in accordance with Annex 13 to the ICAO Convention on International Civil Aviation, EU Regulation No 996/2010 and The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996.

The sole objective of the investigation of an accident or incident under these Regulations is the prevention of future accidents and incidents. It is not the purpose of such an investigation to apportion blame or liability.

Accordingly, it is inappropriate that AAIB reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

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