

Chief Inspector of Accidents
Accident Investigation Division
Civil Aviation Department
46th Floor
Queensway Government Offices
66 Queensway
Hong Kong

Accident Bulletin 2/2011

Aircraft type:	Eurocopter AS332 L2 Super Puma
Registration:	B-HRN
Year of manufacture:	2001
Number and type of engines:	Two Turbomeca Makila 1A2 turboshaft engines
Date and time of accident:	27 December 2010 at 0237 hours UTC (1037 local time)
Place of accident:	Shing Mun Reservoir, New Territories, Hong Kong
Nature of Accident:	The helicopter was lifting an underslung water bucket filled up with water at Shing Mun Reservoir for fire-fighting operation. When the helicopter was on transition to forward flight, the No. 2 engine shut down automatically due to an overspeed signal. The captain decided to ditch the helicopter into the reservoir. All crew members onboard evacuated the helicopter without injury.
Type of flight:	Fire fighting operated by a government agency
Persons on board:	Crew : 3 Passenger : Nil
Fatalities:	Nil
Serious Injuries:	Crew : Nil
Commander's licence:	Hong Kong Airline Transport Pilot's Licence (Helicopters)
Commander's age:	33
Commander's experience:	3,373 hours (of which 1,917 were on type)
Other crew	Flight Deck : One co-pilot Cabin : One aircrewman
Source of information:	Inspector's Investigation

**Aircraft Accident on the Government Flying Service Fire Fighting Operation
on 27 December 2010
(Eurocopter AS332 L2 Registration Mark B-HRN)**

(All times are in UTC. Hong Kong time is UTC+8 hours.)

1. The Government Flying Service (GFS) was tasked to carry out a fire fighting operation at Tai Mo Shan on 27 December 2010. The Eurocopter AS332 L2, Registration No. B-HRN, was deployed for the mission with an underslung water bucket. It was operated by two pilots and one aircrewman.
2. The helicopter took off from the GFS headquarters at the Hong Kong International Airport (VHHH) at 0155 hr. The flight was conducted under Visual Flight Rules (VFR). The helicopter took off with the empty water bucket and the approximate Actual Gross Weight was 8,059 kg, which was within the Maximum Gross Weight for Take-off / Landing of 9,300 kg for the helicopter. The Gross Weight at the first pickup of water with the underslung bucket was 10,022 kg (the heaviest weight of the helicopter for this fire fighting operation) which was within the Maximum Gross Weight of 10,500 kg for underslung operation. The helicopter was within the centre of gravity limits.
3. At 0210 hr, the helicopter arrived at the scene of the hill fire at Tai Mo Shan and the pilot selected the nearby Shing Mun Reservoir for picking up water for the task. On its fifth water pickup with the bucket filled and just lifted clear of the water surface, the helicopter was rotated to gain forward speed at 129 ft above the water surface, the pilot noticed that the helicopter suddenly yawed, and the crew members heard an engine winding down sound. The flight crew noted warning lights with “ALARM”, “PWR 2” and “OEI HI” displayed on the instrument panel. In addition, the captain noticed that the No. 2 engine NG (gas generator rotation speed) was winding down passing through 30% on the No. 2 engine NG gauge. No. 2 engine shut down automatically. The captain decided to ditch the helicopter and called “Power Loss, Ditching”. He also commanded the co-pilot to deploy the emergency floats and the co-pilot did so accordingly. At the same time, the aircrewman released water from the bucket and the captain jettisoned the bucket. A “MAYDAY” call was transmitted by the co-pilot which was acknowledged by Air Traffic Control (ATC) Tower at Hong Kong International Airport. The helicopter ditched in a controlled manner near Pineapple Dam of the reservoir. It was then kept afloat by the four emergency floats.

4. At the time of the accident, the visibility was more than 10 km with clear sky. The Corrected Mean Sea Level Atmospheric Pressure (QNH) was 1021 hPa. The 1-minute mean wind speed, recorded by the Hong Kong Observatory at the Shatin Automatic Weather Station (the closest station to the accident site) at 0237 hrs was 7 knots.
5. After the helicopter ditched, the flight crew activated the “General Cut Out” control, to shut down the remaining engine and isolate the helicopter electrical power. The three crew members were not injured in the ditch. They exited the helicopter and swam ashore. Aircraft accident alerting was initiated by ATC Tower and emergency rescue units arrived on scene. The crews were sent to a hospital for medical examination and were later discharged. The floating helicopter with the lower fuselage submerged drifted towards the shore of the reservoir and was eventually secured at the shore by divers from the Fire Services Department. There was no structural damage to the helicopter caused by the accident. However, some of the avionics equipment were flooded by water after ditching.
6. On 29 December 2010, the helicopter was towed to a dam about 600 metres south of Pineapple Dam and was lifted out of water after its main rotor blades were removed. It was later transported back to the GFS headquarters for investigation.
7. The Chief Inspector of Accidents ordered an Inspector’s Investigation into the cause of the accident in accordance with the Hong Kong Civil Aviation (Investigation of Accidents) Regulations (Chapter 448B). The investigation is being conducted by the Hong Kong Civil Aviation Department (CAD) with the assistance from Eurocopter, the helicopter manufacturer, Turbomeca, the engine manufacturer, and the Bureau d’Enquêtes et d’Analyses pour la sécurité de l’aviation civile (BEA).
8. The accident investigation team conducted interviews with the captain, the co-pilot, the aircrewman and a witness at the scene. The combined voice and flight data recorder (CVFDR) was undamaged and removed from the helicopter safely. The data in the CVFDR was later retrieved with the assistance of Eurocopter and an initial analysis of the data was conducted. It revealed that the helicopter had experienced a power turbine overspeed on No. 2 engine, and the overspeed caused an automatic shutdown of the engine. The reason of the overspeed is under investigation.

9. The voice recording of the cockpit ambient, the Health and Usage Monitoring System (HUMS) computer and the two digital engine control units (DECU) were sent to the BEA for data analysis. The flight documents, maintenance records, weather information, the transcript of the ATC radio recordings and fuel samples of the helicopter were collected for investigation purpose. In addition, the main gearbox (MGB) of the helicopter was sent back to Eurocopter for detailed examination with the process being monitored by the BEA.

10. Based on past experience, the investigation is expected to take more than one year to complete. However, during the course of the investigation, should safety recommendation be necessary, it will be promulgated immediately.

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This Bulletin contains facts relating to the accident as determined up the time of issue. The information must be regarded as tentative and subject to alteration or correction if additional evidence becomes available.