

Aircraft Type and Registration:	Sikorsky S76B Spirit, G-HPLC	
No & Type of Engines:	2 Pratt & Whitney PT6B-36A turboshaft engines	
Year of Manufacture:	1989	
Date & Time (UTC):	21 June 1994 at 1610 hrs	
Location:	2 nm south east of Guernsey, Channel Islands	
Type of Flight:	Public Transport (Charter)	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Substantial to main rotor blades, tail rotor and associated gearbox, tail pylon and fuel tank	
Commander's Licence:	Airline Transport Pilot's Licence (Helicopters)	
Commander's Age:	50 years	
Commander's Flying Experience:	9,013 hours (of which 2,031 were on type) Last 90 days - 52 hours Last 28 days - 23 hours	
Information Source:	AAIB Field Investigation	

History of the flight

The purpose of the planned flight was to deliver a quantity of magazines to the Cunard liner, MV Queen Elizabeth 2 which was sailing in the vicinity of Guernsey, Channel Islands. As there was no existing clearance for the S76B to land on the QE 2, the Operator applied to the Safety Regulation Group (SRG) of the CAA for exemptions to the relevant provisions of the Air Navigation Order (ANO) that it considered necessary for lowering packages onto the deck of the ship (see following paragraph). Prior to the receipt of the exemptions, the commander determined that the proposed load consisted of 20 bundles of magazines weighing a total of 330 kg. After speaking to a pilot who had previous experience of operating to the deck of the QE 2 and agreeing the procedures to be used with the ship's Master, the commander accepted that the best way to achieve the task without landing on the deck would be for a crewman, situated in the cabin of the helicopter, to lower each bundle to the ship's deck by means of a rope while the aircraft was in the hover. On Monday 20 June 1994, the day before the accident, the Operator received a Facsimile Message (FAX) from the CAA granting exemptions to the ANO and detailing the restrictions that applied to the proposed operation. On the morning of the

accident, the actual load was notified to the Operator as comprising 48 packages each weighing 10.5 kg, a total weight of 504 kg. The commander was concerned that the number of packages was more than double that originally proposed. At 1310 hrs, the aircraft departed Blackbushe for Portsmouth where the magazines were loaded. The aircraft then flew to Guernsey Airport where it was prepared for the task by removing the right cabin door. The commander then confirmed with his crewman the method of lowering the magazines to the ship's deck. This would involve placing one package at a time in a canvas bag and lowering in to the deck from the cabin sill. After the fifth bag had been lowered, all the used bags would be recovered to the cabin using the lowering line and the procedure would then be repeated until the task was complete. It was appreciated that this procedure would be both time consuming and physically tiring for both crew members.

At about 1600 hrs, the aircraft departed Guernsey Airport for the QE 2 which was getting under way some two miles to the south east of the island. The deck onto which the packages were to be delivered (Figure 1) was 28.65 metres long by 20.73 metres wide and was marked with an 'H' and three concentric circles of 7.5, 15.0 and 19.5 metres diameter. Despite these markings, it was not a CAA approved helideck i.a.w. CAP 437. It was a passenger sun deck and for this reason, it was surrounded by a steel and glass windbreak which rose to just over two metres above deck level. In preparation for the arrival of the helicopter, the ship's crew had cleared the sun deck of all articles that might be disturbed by the anticipated downwash except for the sun lounge beds and their associated mattresses. These were stacked in two piles in the forward corners of the deck and secured with tailor made close fitting covers before being securely lashed to the deck and windbreak. This system of securing the sun loungers had been in use on the QE 2 for some 26 years and had proved to be satisfactory when helicopters were landing and taking off from the deck. Also as part of the deck preparation, the fire fighting team were stood to and positioned at the aft corners of the deck with foam hoses.

On making radio contact with the ship, the commander was passed a relative wind of 30 kt from dead ahead and was cleared to commence delivery of the packages. Having received his clearance, the commander established a 15 ft hover over the 'H' and the crewman began lowering the packages as briefed. After delivery of the first five bags, during which time the helicopter was experiencing moderate turbulence from the superstructure ahead of it, the commander became concerned that the current method of delivering the bags would take an inordinate length of time which would lead to unacceptable crew fatigue. He therefore moved away from the deck and suggested to his crewman that he seek agreement from the ship to drop the remaining packages to the deck from a low hover rather than continue with the current procedure. The commander considered that the revised procedure would not only be quicker and safer but also have the advantage that no one would be directly below the helicopter during the transfer of the packages. The ship agreed the revised procedure and the

commander re-established a hover over the 'H' but now at a lower height so as to ensure that the packages would not be damaged by dropping and create loose articles that could become a hazard to the helicopter. Estimates of the height of this hover varied considerably, but the balance of evidence suggested that a height of between six and eight feet was maintained. The crewman started to drop the packages from a kneeling position in the cabin doorway and after a short time, estimated by the commander to be two to three minutes but nearer to one minute according to evidence obtained from a video recording of the event, the commander saw a blue coloured oblong shape, which he took to be a large sheet of polythene, appear in his 10 o'clock position. He then saw several more similar shapes and became aware of a vibration through the cyclic control. As the deck below the helicopter was clear, the commander carried out an immediate landing and was then informed by this crewman that the tail rotor had gone. The helicopter had landed just forward of and slightly to the right of the 'H' and still on its original heading. Evidence from the video recording indicated that several mattresses had become dislodged from beneath their restraints and had entered the main rotor. One of the mattresses, or part of it, had then been carried into the tail rotor by the main rotor. This event occurred after the helicopter's wheels had made contact with the deck thus preventing any yaw. While the commander was executing a rapid engine shutdown, fuel was seen to be leaking from the under side of the aircraft which had been damaged by debris from the tail rotor. The fire crew immediately applied foam to the area and there was no fire.

Subsequent examination of the stacks of sun loungers indicated that the mattresses that had entered the main rotor had come from the left-hand stack; the similar right-hand stack had remained intact. The lashings on both stacks were examined and found to be intact. There was no indication that the lashings had slackened during the time that the helicopter was operating over the deck. However, the method of lashing raised the lower edges of the covers above the deck creating an escape path for the mattresses (Photo 1) that could be exploited in the strong turbulence that would have existed with a large helicopter in a low hover. This effect would have been exacerbated by the constraining effect of the windbreak around the sun deck on the rotor downwash and the length of time that the helicopter spent in the low hover. The ship's Master stated that for future helicopter operations, the sun loungers and their mattresses would be removed from the sun deck.

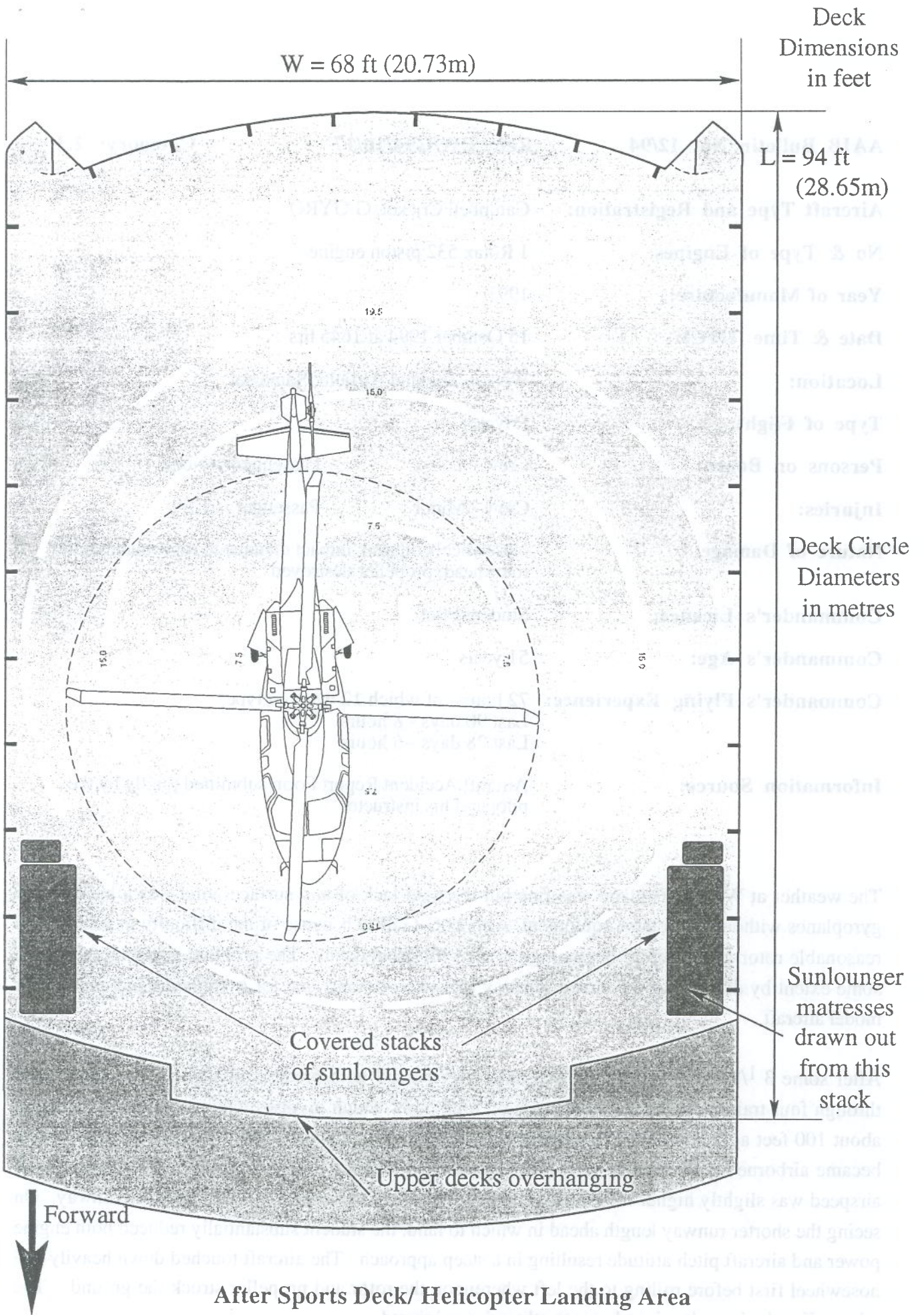
The ANO exemption

On Friday 17 June 1994, the Operator received confirmation of the task for 21 June involving the delivery of magazines to the deck of the QE 2 which would be in the vicinity of Guernsey, Channel Islands. At 1445 hrs, the Operator sent a FAX to the SRG requesting an exemption from the low flying restrictions, Rule 5(1)c of the Rules of the Air, contained in the UK ANO but did not request exemption from Article 43(2) which relates to the dropping of articles. At 1605 hrs on 20 June, the

Operator received a FAX reply from the CAA to their request for an exemption. This document granted exemption to Rule 5(1)e and also granted the exemption to Article 43(2) which was required in order to carry out the task described by the Operator. The Rules of the Air relating to flight in Guernsey airspace are defined in the Guernsey ANO and exemptions can only be granted by the Board of Administration of the States of Guernsey and not the CAA. The Operator stated that the required exemption was granted verbally by Guernsey ATC. Guernsey ATC stated that the exemption was granted after consultation with the Airport Director who has delegated powers from the Board of Administration.



Photo 1



After Sports Deck/ Helicopter Landing Area
Helicopter shown in after landing position

Figure 1