FINAL REPORT

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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 24 June, appointed Mr. John Hughes as the Investigator-in-Charge to carry out a Field Investigation into this Accident and prepare a Synoptic Report.

Aircraft Type and Registration:	Aerospatiale AS 350 B, EI-CGQ
No. and Type of Engines:	1 x Turbomeca Arriel 1B
Aircraft Serial Number:	2076
Year of Manufacture:	1988
Date and Time (UTC):	25 June 2005 @ 10.05 hrs
Location:	Weston Airport
Type of Flight:	Private Flight
Persons on Board:	Crew - One Passengers - Nil
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	Major damage to tail boom, including TR blades and TR head. Skid damaged
Commander's Licence:	CPL (H)
Commander's Details:	Male aged 40 years
Commander's Flying Experience:	4,117 hours, of which 12 were on type
Information Source:	Operator

SYNOPSIS

The helicopter departed the Citywest Hotel to refuel at Weston Airport (EIWT). Having made a visual approach to the airport without incident, the pilot hovered EI-CGQ and air taxied up to the Jet-A1 refuelling area. Realising that he might be blocking the possible exit of the airport fire and rescue vehicle he started to reverse the helicopter. At that point the tail of EI-CGQ struck the Avgas fuel pump and the helicopter went into a horizontal spin and landed hard on the tarmac. The aircraft suffered extensive damage. There was no fire or injury.

1. FACTUAL INFORMATION

1.1 History of the Flight

The helicopter departed the Citywest Hotel at 10.03 hrs and routed the short distance to Weston Airport in order to refuel. ATC requested that the pilot route to the south side of the airport as there was another helicopter departing the ramp area.

Following the departure of that helicopter, the pilot was given clearance to route to the ramp area. With the permission of ATC, the pilot then made an approach to the middle of Runway (RWY) 25 and air taxied into the ramp area via the main taxiway (see pilot's sketch on page 4). At this time a second helicopter was then given clearance by ATC to route to the airport in order to refuel. EI-CGQ continued to air taxi towards the static refuelling pumps on the south side of the ramp.

ATC requested that the pilot leave enough space for the second helicopter positioning behind. The pilot initially considered taxing towards the concrete pad near the left hand pump but was informed by ATC that the Jet A1 fuel pump was the one to his right. He therefore continued taxing to that pump. He then became aware of the possible emergency exit of the Crash Rescue Service (CRS) vehicle located just off the tarmac and next to the pump. He was conscious of selecting a landing spot, which would allow space for the other helicopter to park. He was also conscious of other fixed wing aircraft in the vicinity.

While in the hover the pilot turned the tail to port and not wishing to impede the CRS vehicle backtracked along the edge of the ramp. The pilot looked left and confirmed that he was still over the tarmac ramp area and clear of the grass verge. During this manoeuvre ATC contacted the pilot to confirm his identity. The pilot said he then heard a thud followed by an uncontrollable yawing motion. It appeared that the helicopter rotated about its yaw axis for at least one and a half rotations. The helicopter pitched nose up and he saw debris being thrown outwards. He immediately retarded the fuel control lever. The aircraft descended and landed heavily on the skids. The pilot turned the fuel shut off lever to the OFF position, switched off the battery and vacated the helicopter in the normal way. A sketch of the general accident site as prepared by the pilot is reproduced at **(Appendix A)**.

1.2 Damage to Aircraft

There was severe damage to the tail rotor, and the tail rotor blades disintegrated on impact with standard commercial petrol dispenser. The tail rotor head, rear fuselage and tail rotor skid were damaged. The drive shaft came apart at front and rear flexible couplings and burst the boom skin at these points. The hard landing damaged the rear skid support and possible further damage to the underneath helicopter structure. The RHS horizontal stabilizer was also damaged.

1.3 Other Damage

The outer metal surrounds of the Avgas dispenser were damaged due to contact with the tail rotor and tail rotor blades. The pump was out of commission for some time following this accident and was eventually replaced.

1.4 Additional Information

This Avgas fuel storage installation at the aerodrome consists of an over-ground fuel tank with an underground feed pipe to a standard forecourt petrol dispenser **(See Appendix B**). The dispenser, which is adjacent to the aircraft parking area, is sited on the tar macadam ramp at about 1 metre in from the grass verge. The fuel outlet from the dispenser feeds an adjacent fuel filter and from there, to the refuelling nozzle via a 30 metre loose hose.

In June 2004, a similar incident occurred in the vicinity of this Avgas dispenser involving a twin-engine Islander aircraft. The balance weight on the right wing struck the dispenser on aircraft departure.

As a result of the subsequent AAIU Synoptic Report (No. 2005-026) and Safety Recommendation (SR 25 of 2005) meetings took place between Airport Management and the Airworthiness Department of the IAA on the safety standards applicable to Avgas dispensers at Airports. As detailed in the above Report, the HSA also require that areas where explosive atmospheres may occur should be classified into zones and these zones marked accordingly. Guidance from the EU Commission is also available in Directive 1999/92/EC. The UK CAA CAP 748 (Airside Safety Management) defines a "Fuelling Zone" as an area that would qualify as a Zone O or Zone 1 under the Dangerous Substances and Explosives Atmosphere Regulations (DSEAR). The above Directive states *"if the hazardous place is not the whole space concerned, but only part of it, that part may be marked by yellow/black diagonal stripes (e.g. on the floor). It may be desirable to place other warning signs in accordance with 92/58/EEC for example, smoking forbidden etc."*

At the time of this accident involving EI-CGQ, it was evident to the Investigation that adequate markings were not in place following the Islander incident.

The Investigation was informed that since the accident, non Weston based helicopters, coming to refuel, now land at a helipad at the new terminal building to the north of RWY 25. A mobile fuel truck may then refuel the helicopter. Based helicopters are now compelled to land on the concrete pad adjacent to both the Avgas and Jet A1 dispensers. The CRS vehicle is now located elsewhere. Whilst not present at the time of this accident a painted red line with "No Wheel/Skid" on the tarmac now serves to remind personnel of their proximity to the pumps.

It is envisaged in the airport plan that all fixed wing and helicopter operations will move to the north side of the main runway.

2. ANALYSIS

The Captain was responsible for the parking and taxiing of his aircraft. Reversing without the aid of a crewman on board or a ground marshaller demands that the pilot be extra vigilant. In such cases the pilot should perform clearing turns beforehand in order to verify that the path rearwards is clear. In this case there were other circumstances, which together, construed to distract the pilot during the exacting operation of air taxiing and landing the helicopter on the tarmac. In retrospect, it would have been better to taxi the helicopter sideways to the vicinity of the Jet A1 fuel pump rather than turning the tail to port. The Aerodrome Licensing (ALM) manual states that the helicopter Operator must be satisfied that the proposed landing site, arrival and departure routes, helicopter performance and facilities provided on site are such that landing and take-off may be undertaken without undue hazard to persons or property.

This could have been a more serious accident had there been greater damage to the fuel pump or if the tail rotor blades had cut the refuelling hose. It would be considered normal practice to have the hose stowed in an adjacent reel alongside the dispenser. It is questionable whether the Airport CRS vehicle had to be stationed near the refuelling dispensers. The ALM states that vehicles should be so located that they can be brought into action quickly to respond to all areas covered by the service. It also states that for helicopters with skid undercarriages that are obliged to hover-taxi between the apron and the operating area, "the provision of a discrete helicopter apron should be considered".

It is envisaged in the airport plan that all fixed wing and helicopter operations will move to the north side of the main runway. However, in the meantime, if refuelling in this area continues it would be appropriate to paint the ground around the pumps with alternate yellow/black markings so that the danger zone is clearly visible.

3. CONCLUSIONS

(a) Findings

The tail rotor struck the Avgas Fuel dispenser whilst the helicopter was positioning to refuel at the Jet A1 dispenser.

(b) Cause

Failure to assure adequate clearance whilst manoeuvring in close proximity to the static fuel dispenser.

(c) Contributory Factor

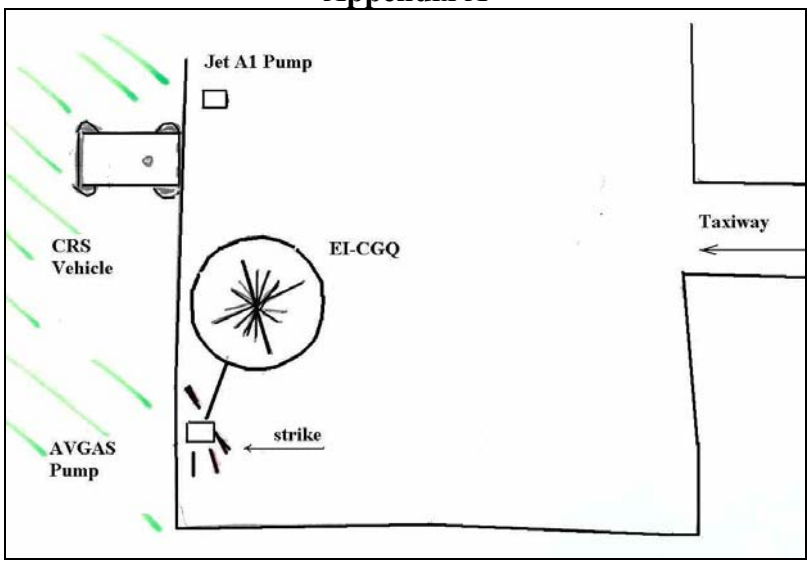
There were inadequate ground safety markings in the immediate area of the fuel dispensers.

4. SAFETY RECOMMENDATIONS

1. Whilst the fuel dispensers continue to be used, the Airport Management should ensure that the Fuelling Zones are marked in accordance with DSEAR regulations. **(SR 01 of 2007)**

2. All refuelling hose should be installed on a reel. **(SR 02 of 2007)**

Appendix A



Reproduction of pilot's sketch of refuelling area

Appendix B

The above photo shows the scene at the time of the accident. The Avgas dispenser is in the foreground, with the helicopter and CRS vehicle in the background.

Damage to the tail, tail rotor head and blades of EI-CGQ.

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