

PART 1.3 – NARRATIVE OF EVENTS

All times local (Zulu plus 1 hour).

Synopsis

- | | |
|---|---|
| <p>1.3.1 On 20 Apr 12, Squirrel HT1 ZJ276 of the Defence Helicopter Flying School (DHFS) was planned to fly a solo-student sortie (BRW 34) from RAF Shawbury to Chetwynd field location (an MOD owned site approximately 10 miles to the East of RAF Shawbury) as part of the Single Engine Rotary Wing (SERW) syllabus. The sortie comprised of a transit to Chetwynd field where a series of Quick Stop (QS) manoeuvres, both into wind (ITW)¹ and downwind (DW)² were to be flown before returning to base for the only scheduled landing of the sortie.</p> | <p>Exhibit 1, 2 & 3
Witness 1</p> |
| <p>1.3.2 At 1507 hrs on 20 Apr 12, ZJ276, callsign B228, took off from RAF Shawbury and transited to join Chetwynd where the landing direction was 260°, the same as his previous QS sortie. The Student Pilot (SP) then conducted both ITW and DW QS in Area Right³. At 1546 hrs, the SP positioned for a DW Flare and Turn QS. During the final stages of the manoeuvre a rate of descent (RoD) built up and the aircraft unexpectedly impacted the ground (N 52 48 54.0, W002 24 25.6), within Chetwynd field, with low forward but significant vertical speed. Shortly after impact the horn sounded⁴ for approximately 2.5s and the SP reported seeing an indication on the centralised warning panel (CWP).</p> | <p>Witness 1
Exhibit 4 & 5</p> |
| <p>1.3.3 The SP decided to take-off and continue with the sortie. He positioned for an ITW QS and during the final stages of this manoeuvre the SP believed he was experiencing vortex ring. He attempted to gain forward airspeed using cyclic and lowered the collective lever but, with height rapidly decreasing, made a conscious decision to adopt the landing attitude for an inevitable impact. The aircraft impacted the ground within Chetwynd field (N 52 48 51.2, W002 24 29.1) at 1551 hrs. The pilot was uninjured by the impact and was able to successfully shut down the engine using both the normal and emergency shut-off, but did not apply the rotor brake. Once the rotor blades had slowed the pilot was able to egress via the right hand main door.</p> | <p>Witness 1
A & B</p> |
| <p>1.3.4 The aircraft had been assessed as Cat 4.</p> | <p>Annex A</p> |

Pre-Accident Events

Crew Composition

- | | |
|---|------------------|
| <p>1.3.5 Student Pilot (SP)</p> <p>a. Pre DHFS. The SP joined the RN on 27 Apr 09 and after Basic Officer Training undertook Elementary Flying Training (EFT) with 703 Naval Air Sqn (NAS), Barkston Heath from 17 May to 15 Dec 10. He then completed a number of non-flying holdovers prior to returning to 703 Sqn where he completed refresher training on 1 Dec 11. Prior to commencement of rotary wing training the SP had</p> | <p>Exhibit 6</p> |
|---|------------------|

¹ Starting into wind, at approximately 50 ft visually judged, the aircraft is slowed from 90 kts to the hover while maintaining level flight by co-ordinating cyclic and collective inputs. On completion of the manoeuvre the aircraft is moved in a controlled fashion forward and down to a 5 ft hover.

² Starting from 90 kts and a stated height downwind, the aircraft is then flared and turned, maintaining level flight, with the final stages of the deceleration happening into wind; the pilot should maintain a minimum 30 kts IAS until within 30° of the into wind heading.

³ Chetwynd does not have a runway but the area is divided into two (Area Left and Right) by a line drawn through the central windsock. The orientation of this line is selected by the operating aircraft and is generally coincident with the wind direction.

⁴ The Squirrel is fitted with an audio warning system which will warn the pilot of either low hydraulic pressure or low rotor speed.

accumulated 215hr (158hr dual, 57 solo/1st pilot), including 101hr flying the Vigilant T1 on a Voluntary Glider Squadron (VGS).

b. **DHFS.** On 9 Jan 12, the SP enrolled on DHFS 148 SERW Course and had completed the requisite training in-line with the BRW syllabus up to the day of the crash. He had accumulated a total of 29hr 50min dual and 3hr 5min solo (total 32hr 55min) prior to the accident.

Exhibit 6

Previous 24 hours

1.3.6 The SP flew BRW 32 (QS sortie 1(dual)) on the afternoon of 19 Apr 12 and, after an uneventful evening, went to bed at approximately 2330 hrs. He awoke at approximately 0715 hrs and reported for work at 0745 hrs. He attended the 660 Sqn morning brief at 0810 hrs. This was followed by a verbal periodic progress brief and a sortie brief for BRW 33 (QS sortie 2 (dual)) given by his primary Qualified Helicopter Instructor (QHI). Flying phase 4A was declared at 0926 hrs and remained extant for the remainder of the day. Following a rotors-running crew change on ZJ276 the SP flew BRW33 between 1140 hrs and 1255 hrs at Chetwynd, later than planned due to an airframe change earlier in the day. The bulk of the exercise was flown in Area Left at Chetwynd with a further QS flown in Area Right at the end of the sortie prior to returning to RAF Shawbury. Having shut the aircraft down, the instructor signed the aircraft in; in preparation for the planned afternoon solo-sortie the SP then immediately signed the Sector Record Page within the aircraft technical log. He then had lunch.

Witness 1 &
2
Exhibit 7, 8 &
9

Sortie Details and Preparation

1.3.7 After lunch, the SP had a combined debrief for BRW 33 and brief for BRW 34 (solo QS sortie) from his primary QHI. This was in the same aircraft (ZJ276), with a rotors-running crew change from another solo student. The sortie was to follow a similar profile as the BRW 33, but was to be flown in Area Right at Chetwynd and not Area Left. The student out-briefed the sortie in the 660 Sqn Ops Room in the presence of his QHI and the Sqn Duty Instructor (DI). The sortie was authorised by the student's QHI.

Witness 1, 2
3 & 4

1.3.8 Prior to his sortie the SP was programmed to be duty student; he also assisted another solo student during a rotors-running crew change, by acting as 'stick-hold'.

Exhibit 1
Witness 1 &
5

Sortie Execution

1.3.9 At 1459 hrs, ZJ276 returned a few minutes earlier than planned from the previous BRW 34 and the SP conducted a rotors-running crew change. With the SP in the right seat, ZJ276, callsign B228, took off from dispersal at 1507 hrs to commence the briefed BRW 34 sortie. After an uneventful transit from RAF Shawbury, at 1517 hrs the SP called "*established*" in Area Right at Chetwynd. At that time, there were 3 other aircraft from 660 Sqn already operating at Chetwynd. In Area Left, callsign S45, crewed by 2 instructors, was conducting staff continuation training and callsign B230, a solo student, was conducting an advanced transitions sortie. In Area Right, callsign B232 was conducting BRW 34, the same exercise as the SP. The SP then commenced a series of QS manoeuvres (10 in total), both ITW and DW. Less than a minute after the SP called established at Chetwynd, callsign S45 departed, with callsigns B230 and B232 departing at 1523 hrs and 1537 hrs respectively. This left the SP as the only aircraft operating at Chetwynd. At this

Exhibit 4, 5, 8
& 9

Witness 1, 3,
5, 6 & 7

juncture the SP had initiated 7 QS manoeuvres with five successfully completed and two that he curtailed by initiating a go-around.

1.3.10 At 1546 hrs the SP commenced his 9th (penultimate) QS manoeuvre, a DW flare and turn. Having positioned into wind, he then turned through 180° during which he commenced a descent, aiming for a start position over the northern edge of Chetwynd. He completed the turn and during the final stages of the manoeuvre the SP reported experiencing a rapid RoD from approximately 20 ft; the aircraft unexpectedly impacted the ground on a heading of about 260° within Chetwynd field. The aircraft impacted the ground with low forward speed but with considerable force. Shortly after impact, the horn sounded for approximately 2.5s and the SP reported seeing an indication on the Centralised Warning Panel (CWP). The aircraft remained on the ground for approximately 10s before lifting into the hover. The SP reports turning in the hover in order to inspect the ground before transitioning into forward flight.

Exhibit 4
Witness 1
Annex A

Accident Events

1.3.11 Having elected to continue the sortie the SP conducted a standard 500 ft oval circuit for an ITW QS. Having selected his run-in markers on 260° and noted the wind indication on the windsock, at 1550 hrs the SP initiated the entry to an ITW QS. During the manoeuvre the freewheel unit⁵ activated intermittently. In the final stages of the manoeuvre a RoD developed. Suspecting vortex ring, the SP reported attempting to gain forward airspeed by adopting a nose down accelerative attitude with the cyclic and lowering the collective lever slightly. As height decreased, and in anticipation of a crash, the SP made a conscious decision to adopt the landing attitude. At 1551 hrs the aircraft impacted the ground. Upon impact the aircraft horn sounded and silenced after 1.7s. The aircraft came to rest in an upright position with the underside of the cockpit touching the ground.

Exhibit 4
Witness 1
Annex C

Post Accident Events

1.3.12 The SP initiated engine shut down by closing the throttle and operating the fuel shut-off lever. The horn sounded. The SP reported not applying the rotor brake. The uninjured SP remained in the aircraft on intercom until the rotor blades had slowed sufficiently for him to egress the aircraft via the already open starboard main door.

Exhibit 4
Witness 1
Annex A

1.3.13 The tail pylon had failed in the area of the transportation joint. The vertical stabiliser with stinger (tail skid) had fractured. The tail rotor gearbox mounting support had fractured. One of the two tail rotor blades had failed at its blade root end, separated from the aircraft and come to rest 20m to the left of the aircraft's final position. The port side baggage access panel and starboard crew door were open. The undercarriage was severely damaged with the forward support assembly distorting the underside of the airframe structure and the forward support struts collapsed. The starboard skid forward vertical strut had sheared near the skid attachment point. The port skid forward vertical strut failed at the strut upper attachment point. The front of the starboard skid was within the aperture of the open starboard door and prevented the door being closed. The front of the port skid obstructed the closed port door and prevented the door being opened. All transparencies were intact. The main rotor blades remained attached to the main

Annex A

⁵ The freewheeling unit automatically disengages the engine from the main rotor when engine r.p.m. is less than main rotor r.p.m.

rotor head and appeared undamaged. The rotor brake lock was in the flight position and the rotor brake lever was in the off position. There was no post-crash fire.

Escape and Survival

1.3.14 The SP evacuated the aircraft without assistance. Once clear of the aircraft, at 1555 hrs, he used his personal mobile phone to inform the DHFS Executive Flying Supervisor (EFS) that he had suffered a 'heavy landing' at Chetwynd. A passing member of the public approached the aircraft to check on the condition of the pilot and to ascertain that he had summoned assistance.

Witness 1, 8,
9, & 10
Exhibit 10

PCM

1.3.15 Around the same time as the initial notification of a 'heavy' landing was being relayed to the EFS, Ternhill attempted to make contact with B228 to establish 'ops normal'⁶. At 1603 hrs a civilian helicopter, callsign Helimed 03E, which was passing Chetwynd and talking to Ternhill on VHF, reported "*he's [B228] on the ground at the moment, which is probably why he can't hear you*".

Exhibit 5

1.3.16 At 1610 hrs the Ternhill fire crew were dispatched by Ternhill ATC. Also at 1610 hrs RAF Shawbury Supervisor declared Crash State 3. ATC subsequently broadcast on the Station Tannoy declaring the activation of the Crisis Management Centre and Contingency Plan (CP) 1. A DHFS Squirrel (callsign S26) was tasked to go to Chetwynd with the Senior Medical Officer (SMO), a Medic and an FBH engineer. At approximately 1620 hrs, RAF Shawbury Ops was notified of the event.

Exhibit
5, 11, 12 &
13
Witness 10,
11 & 12

1.3.17 At 1626 hrs the fire crew (Crash 3) arrived at Chetwynd, but their entry to the field was delayed as they did not have keys for the crash gate padlocks. The fire crew reported that the aircraft tail had broken and the nose was on the ground, they then attended to the SP. At 1629 hrs RAF Shawbury ATC informed Ternhill that the CP 1 had been activated. The SMO arrived on scene at 1631 hrs and assumed responsibility for care of the SP, whilst an aircraft engineer ensured that the aircraft was in a safe condition and disconnected the battery. At 1635 the CMC was activated. The fire crew called 999 giving details of the incident and an Air Ambulance arrived at Chetwynd at 1653 hrs. The Air Ambulance departed at 1719 hrs and took the SP to The Royal Shrewsbury Hospital.

Exhibit 5, 11 &
13
Witness 1,
10, & 13

1.3.18 At 1805 hrs the Post Crash Management Incident Officer (PCMIO) assumed control of crash scene and the fire crew departed. A civilian police officer arrived at Chetwynd at 1900 hrs. The guard force arrived at 2015 hrs and the PCMIO handed over to the Guard Commander.

Witness 11
Exhibit 13

1.3.19 The SP was released from The Royal Shrewsbury Hospital at 1900 hrs and PIDAT actions were completed by 2015 hrs.

Witness 1
Exhibit 14

1.3.20 MilAAIB Investigators arrived at Chetwynd at 0935 hrs on 21 Apr 12. JARTS arrived at Chetwynd at 1016 hrs on the same day.

Exhibit 13

1.3.21 The aircraft was left in situ and Chetwynd field was placed out of bounds until after the aircraft was recovered.

Annex A

⁶ Single aircraft operating at Chetwynd are required to transmit 'ops normal' every 20 minutes to Ternhill ATC.

1.3.22 The SI Panel was formally convened on 24 Apr 12 and viewed the crashed aircraft, in situ, on 24 and 25 Apr 12.

Annex A
Exhibit 13

1.3.23 **Media.** There were no media enquiries.

Exhibit 13

Salvage Operations

1.3.24 ZJ276 was recovered by road to RAF Shawbury on 25 Apr 12 by JARTS under the direction of the MilAAIB.

Annex A

1.3.25 Remediation of the Accident Site was completed the following week.