## PART 1.4 – FINDINGS

Evidence

### Methodology

1.4.1. **Accident Factors.** Each finding by the Panel is attributed the following accident factors:

a. **Cause.** Factors that led directly to the accident.

b. **Contributory.** Factors that did not directly cause the accident, but made it more likely.

c. **Aggravating.** Factors that did not cause the accident but made the final outcome worse.

d. **Other.** Factors that were none of the above but could contribute to, or cause, a future accident.

e. **Observations.** Factors that, whilst not germane to the accident and not thought likely to influence a future accident, were considered important aviation safety-related issues worthy of comment.

1.4.2. **Human Factors Modelling.** Prof James Reason offers a well recognized and widely employed technique to identify multiple hierarchical, socio-technical and interrelated factors that influence an occurrence. Known colloquially as the 'Swiss Cheese' model (Reason, 1997), the Panel has exploited the work of Reason in its analysis of the accident involving ZJ276 by assessing evidence across the following categories[1]:

a. **Unsafe Acts.** Fact-based non-judgemental statements aimed purely at categorising potentially unsafe acts of an individual (or team), whether intentional or unintentional; the aim being to clearly identify specific error types so that a correct assessment can be made of human performance issues relating to cited accident factors. Grouped as[2]:

i. **Unintentional Acts.**

(1) **Slips.** Error by commission; where a well practiced skill, requiring little cognition, is carried out incorrectly.

(2) **Lapses.** Error by omission; where a well practiced skill, requiring little cognition, is not carried out.

ii. **Intentional Acts.**

(1) **Mistakes.** Deficiencies in judgement and/or failing to formulate the right plan based on flawed knowledge and/or incorrect comprehension of rules.

(2) **Violations.** Deliberate and conscious departures from established rules/procedures, although often with no intent to cause harm.

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[1] ASIMS exploits a similar methodology.

[2] Reason, J. (1990). *Human Error.* New York: Cambridge University Press – 'Errors represent the mental or physical activity by individuals that failed to meet their intended outcome'. Note for the purpose of this SI, the Panel considers an error has occurred when the individual (or team) fails to achieve what a given situation required (whether a consciously planned action or not).

b. **Error Promoting Condition (EPC).** The psychological, physical/mental limitations and physiological factors that can influence human performance, i.e. capacity, fatigue, etc.

c. **Organisational Influences.** The broader (often indirect and latent) influences that a higher organisation brings to bear on those involved in an occurrence, and which are beyond those individual's control in terms of resources, climate, etc.

d. **Breached (or failed) Defences.** Those rules, orders, practices and procedures designed to assure the safe operation of aircraft, which failed or were breached by those involved.

1.4.3. **Causation.** Key to the Panel's exploitation of Reason's HF model was a coherent and consistent approach to understanding accident causation. This in turn facilitates a clear understanding of short-comings within each category, for which the Panel can consider appropriate intervention strategies; thereby delivering recommendations targeted at preventing or reducing the likelihood of recurrence.

1.4.4. **Available Evidence.** The Panel had access to the following evidence:

a. Interviews with the pilot of ZJ276 and other witnesses.

b. CVR, providing cockpit voice and area microphone recordings of the final 2 hr of the aircraft's operation, including the final sortie. This was assessed against a reference recording from another Squirrel helicopter[3].

c. Photographic images from various sources.

d. Relevant orders, TORs and documentation including flying logbooks, aircraft documentation, sortie planning and briefing materials.

e. Wreckage of ZJ276.

f. Aircraft technical report produced by MilAAIB.

g. An audit of ZJ276 documentation conducted by the Squirrel AS350BB Continuing Airworthiness Manager.

h. JARTS report.

i. RAFCAM Reports.

j. Briefing of, and Flying of (simulated) Vortex Ring (VR) related sorties in the Griffin full motion simulator and Squirrel Part Task Trainer (PTT).

k. All flight safety related material, including ASIMS and Squirrel PT reports.

l. Previous BOI and UI Reports.

[3] Squirrel HT Mk1 ZJ278 sortie flown on 4 May 12

1.4.5. **Unavailable Evidence.** The Panel did not have access to the following evidence:

a. The Panel were unable to determine the actual control position / inputs due to a lack of an Accident Data Recorder (ADR).

b. Exact weather conditions at Chetwynd due to lack of monitor and recording facilities.

1.4.6. **Services.** The Panel was assisted by the following personnel and agencies:

a. MilAAIB.

b. RAFCAM.

c. Specialist technical support from 1710 NAS MIG, QinetiQ, Handling Squadron and the Empire Test Pilots School (ETPS).

d. Eurocopter and FBHeliservices.

## Factors Considered by the Panel

1.4.7. The following factors were considered by the Panel, from which accident factors have been determined along with relevant categories from Reason's HF model:

a. **Pre Accident**.

i. Student Pilot's Background.
ii. Single Engine Rotary Wing Flying Training (SERW).

b. **Day of Accident**.

i. Flying Programme.
ii. Time Pressure.
iii. Aircraft Maintenance History & Preparation for Flight.
iv. Supervision & Authorisation.
v. Overview of Chetwynd.
vi. Initial Phase of Sortie.

c. **Penultimate QS and Unintentional Impact**.

i. Aircraft Systems.
ii. Weather.
iii. Flying Technique.
iv. Other Factors.
v. Unintentional Impact.
vi. Heavy Landings.
vii. SP's Decision to Continue Sortie.

d. **Accident**.

i. Final Into Wind QS.
ii. Vortex Ring (VR).
iii. Final Sequence.
iv. Final Impact.
v. Aircraft Technical.

e. **Post Accident.**

i. Survival Aspects.
ii. Shutdown.
iii. Personal AEA.
iv. Post Crash Management (PCM).
v. Salvage Operations.
vi. Costs of Damage to Aircraft & Civilian Property.

f. **Wider Issues.**

i. Chetwynd Field.
ii. Ab initio Solo Flying.
iii. Documentation.
iv. Safety Management System.

## Analysis of Factors

## Pre Accident

## Student Pilot's (SP's) Background

1.4.8. **SP Background**. Prior to commencing Royal Navy Basic Officer Training at Britannia Royal Naval College (BRNC) in Apr 09, the SP had accumulated 101 hrs flying the Vigilant TMk1 motor-glider on a Voluntary Gliding Squadron (VGS). On passing-out from BRNC, in Jan 10 he completed Tutor flying grading (11 hrs 10 minutes) where he achieved an overall B2 (high average) assessment. Elementary Flying Training (EFT) followed on 703 Naval Air Sqn (NAS), Barkston Heath from 17 May to 15 Dec 10 where he was graded high average (4.3) with an accompanying comment that 'his true assessment was within the above average bracket'. He was assessed as suitable for either Fast Jet (FJ) or Rotary Wing (RW) training. Following EFT, owing to a backlog in the training pipeline, he then completed a number of holdover duties. Prior to RW training he then completed a formal refresher training course on the Tutor with 703 NAS from 26 Sep – 1 Nov 11 where he '*surpassed the required output standard for the RN Tutor Refresher Course*'. He remained with 703 NAS, where he flew, as 2nd pilot on a number of Staff Continuation Training (SCT) sorties; his last Tutor sortie being flown on 12 Dec 11. Two years after commencing flying training the SP joined 148 Single Engine Rotary Wing (SERW) Course at Defence Helicopter Flying School (DHFS) on 9 Jan 12; his overall FW flying consisted of 215hr (158hr dual, 57 solo/1st pilot) (Ab initio with no previous flying would expect to fly approximately 68hr dual 8hr solo assuming 1 refresher course as the SP). The SP had a high degree of fixed wing experience compared to the level expected of a student pilot at this stage in flying training, particularly in regard to solo hours. Exhibit 6

1.4.9. **Continuity of training**. As a consequence of the current RW pilot throughput/requirement, the SP spent some considerable time in holding appointments between flying courses where, although in an aviation environment, his flying skills were not maintained (ideal pipeline would see a student pilot commencing SERW 72 weeks after entering BRNC; the SP had spent 141 weeks in the RN prior to commencing SERW). Although the Panel could find no formal evidence / studies as to the impact that prolonged Hold Overs had on students, an audit of DHFS raised concerns about the Hold Over strategy within the Flying Training Pipeline[4] and a review was recommended. Whilst the SP had conducted the requisite refresher flying and met the DHFS input Exhibit 6,15 & 16 Witness 1, 14, 15 & 16

[4] DHFS Second Party Training Quality Audit Report: 11/12 Jul 11

standard, the Panel had insufficient evidence as to the impact of protracted holdovers on student performance and morale and was **unable to exclude this as a factor.**

1.4.10. **Course Record Folder (CRF).** Student progress was recorded in the SP's CRF, with appropriate qualifications being recorded in his flying log book. The trend in the SP's grades can be seen in Fig 1, which shows generally high to above average marks, commensurate with the reports of him as a '*good student*'. Results leading up to BRW 34 show less consistent performance and a slight decrease in grades. Closer scrutiny of the CRF revealed a history of poor balance control, poor height keeping and a lack of precision in the hover. Witness 1, 2, 6, Exhibit 6

1.4.11. **Student Progress.** Given that the SP had considerably more aviation experience than his peers, the Panel sought to understand any effect this may have had on progress. The SERW syllabus is constructed to provide a building block approach to RW flying for a pilot with the minimum input standard of hours. With some 215hr of flying time amassed, the SP would have been advantaged over his course colleagues when dealing with the generic aspects of flying, such as airmanship and RT, during the early sorties. This advantage may have manifested itself to instructors as a perception of increased capacity as reflected in the marks but the Panel is of the opinion that this may have masked a trend of average handling skills as reflected in the write-up content. In interview the SP reported being very disappointed at receiving a low average mark several sorties prior to BRW 34; as the sorties became more complex, it is possible that this initial advantage may have been eroded, placing the SP in a less familiar learning environment with consequently reduced capacity. The Panel concluded that the SP's progress was **not a factor**, but his capacity to deal with unexpected situations was more significant and is considered at para 1.4.46. Exhibit 6

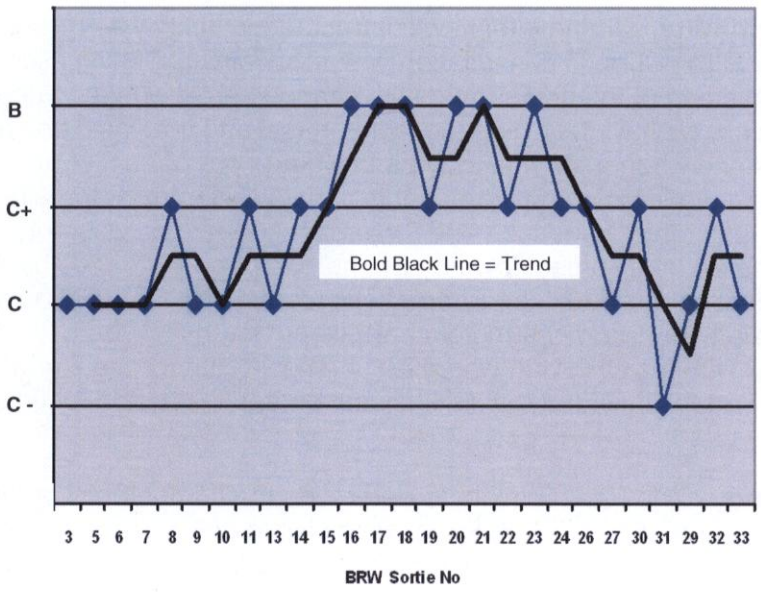


*Figure 1 – SP's Course Trend*

## Single Engine Rotary Wing (SERW) Flying Training

1.4.12. **Defence Helicopter Flying School (DHFS).** SERW is conducted for the UK Armed Forces at DHFS, which is an OF5 commanded independent unit based at RAF Shawbury. The training is conducted on either 660 Squadron, Army Air Corps (AAC) or 705 NAS, these are 'parallel' training sqns teaching alternate student intakes the same Basic and Advanced syllabus. The CFS(H) Exam Wing visit to 660 Sqn between 29 Jan – 3 Feb 12 declared that there was '*no discernable difference*' between Exhibit 17 Witness 16 & 17

705 NAS and 660 Sqn AAC and the Panel concluded that parallel sqns was **not a factor**.

1.4.13. **Staff Flying Hours**. DHFS currently runs 8 SERW courses per year, each course is capable of training up to 18 students. In 2010, DHFS trained 175 students on SERW, this reduced to 84 in 2011 and the forecast figures for 2012 are 70. The reduction in associated instructional hours was mitigated by increased SCT. The Panel concluded staff flying hours was **not a factor**.

Exhibit 18, 19 & 42
Witness 8, 16 & 18

1.4.14. **Instructional Hours.** The Panel **made the observation** that with the reduction in student throughput and consequent reduction in available instructional hours, B2 instructors were afforded priority to enable them to achieve the requisite hours for upgrade to B1, with more experienced instructors having less opportunity to teach and / or upgrade to A2, which in the long-term may dilute overall experience within the instructor cadre.

Annex D

1.4.15. **QHI Experience**. Each SERW sqn is established for 20 Central Flying School (CFS) trained Qualified Helicopter Instructors (QHI) with a 60/40% split of military to civilian instructors. At the time of the accident 660 Sqn had 18 QHIs. On arrival at DHFS, all instructors must complete a training package tailored to the needs of the individual and fly a Competent to Instruct (C to I) sortie with DHFS Standards. This is followed by a Sqn Acceptance Check and then regular standardisation checks. Those instructors newly graduated from CFS(Helicopter) Sqn arrive on 660 Sqn as B2 QHIs and are then mentored through the instructional process to re-categorise to B1 within 9 months and 120 instructional hrs of arrival. The Panel concluded that 660 Sqn had sufficient experienced QHIs with good levels of supervision and training; therefore, instructor experience was **not a factor**.

Exhibit 20, 21 & 71
Witness 17

1.4.16. **Instructor Continuity**. During interview, instructor continuity was raised as a potential issue. The Sqn Flight Cdrs, in consultation with the Training Officer, allocate QHIs to students at the beginning of the course and QHI changes are made at various milestones during the training, typically following the 'solo phase' and the basic phase. There are also other occasions when a change may be instigated on request of an individual to ensure the optimum learning environment is maintained. Whilst the aim was to fly with the primary QHI other influences and factors mean that this was not always possible. During the 29 dual sorties flown by SP, he had been instructed by 6 different QHIs. The organisation showed itself sympathetic to ensuring that continuity was maintained by minimising short-term instructor changes. In interview, the SP reported that he got on well with his QHI, with whom he had flown with for the 8 sorties prior to the accident. The Panel concluded that QHI allocation and instructor continuity was **not a factor**.

Witness 1
Exhibit 6 & 21

1.4.17. **QHI Competency**. The Panel sought to determine the competency of the QHIs that instructed the SP. The 2012 CFS(H) Exam wing visit to 660 Sqn assessed all the QHIs were operating at or above category. The SP's primary QHI (B1) was assessed as Above Average in all aspects of his ground and flying instructional abilities, including QS. The Panel concluded that the SP's primary QHI was suitably qualified to instruct and up to standard and therefore, QHI competency was **not a factor**.

Exhibit 17

1.4.18. **SERW Syllabus**. The SERW syllabus is divided into a number of phases as detailed in the Syllabus of Hours (SoH) and students are required to achieve the standards detailed in the Training Performance Standard (TPS) documentation in order to pass the course. Prior to the accident sortie the SP had flown all the prerequisite exercises (28 of the 31 dual flying sorties plus 1 dual check sortie) amassing 29hr 50min dual and 3hr 05min solo. The Panel concluded that the implementation of the syllabus was **not a factor**.

Exhibit 6, 22 & 23

1.4.19. **Quick Stop (QS) Phase**. The accident happened during a solo QS sortie (BRW 34) and therefore the QS phase was considered in more detail by the Panel. The QS phase consist of 3 sorties (BRW 32 – 34) 2 x dual sorties (1hr 15min each) followed by a 1hr solo sortie. QS are essentially a dynamic, low level, advanced co-ordination exercise that allows a pilot to make a rapid transition from forward flight to the hover. The technique emphasises the use of external references for judging attitude, Angle of Bank (AoB), height and heading with occasional confirmatory glances at the flight instruments. The sorties includes Into Wind QS (ITW QS) and Downwind QS (DW QS). Exhibit 2, 3, 24 & 25

a. **ITW QS**. The ITW QS is carried out from 90 kts straight and level at an assessed height of 50 ft, with the TPS permitting a +/- 20 ft height tolerance[5]. The absolute minimum height permitted for this manoeuvre is 30 ft agl. The pilot selects a heading marker in the distance and confirms height on the Radar Altimeter (rad alt). The QS is initiated by vocalising "quick-stop, quick-stop go". On the executive word "go" the pilot flares with the cyclic (up to a maximum of 25° nose-up) and simultaneously lowers the collective lever, whilst applying left pedal to maintain balance. Height is maintained with collective and assessed using the "backdrop technique[6]". As the flare starts to lose effect, the collective is raised progressively to maintain height, whilst applying right pedal to maintain balance; as the ground speed approaches zero, the attitude is adjusted and sufficient power applied to establish the high hover[7]. Once established in the high hover, the pilot gently moves the aircraft forward and down to the normal (5 ft) hover height. Exhibit 2 & 26

b. **DW QS**. DW QSs are carried out on a downwind heading at 90 kts IAS and 50 ft agl (judged visually). The manoeuvre is either initiated with a flare whilst maintaining height and then rolling into a level turn using up to 35° AoB (Flare & Turn) or initiated by rolling into a level turn, again up to 35° AoB and then once established in the turn flaring the aircraft whilst maintaining height (Turn & Flare). As the aircraft is slowed it is important to maintain at least 30 kts or more until within 30° of the surface wind before finally decelerating the aircraft in order to establish a high hover into wind, prior to moving forward and down to the normal (5 ft) hover height. Exhibit 2

## Day of Accident - 20 Apr 12

1.4.20. **Flying Programme**. The planned flying programme (Fig 2)[8] was drawn up on the previous evening and met the extant regulations pertaining to student QS sorties at Chetwynd which limit the number of BRW QS sorties which may be conducted concurrently. The programme was de-conflicted with other sqns at the daily station ops brief. The programme changed as a consequence of weather, aircraft serviceability and personnel availability and was managed by the 660 Sqn Duty Instructor (DI). A representation of the sorties flown is at Fig 3. The Panel noted that there was no requirement for a staff member to be at Chetwynd whilst student solo flying was being conducted. Exhibit 1, 8, 20 & 27 Witness 4

[5] BRW Syllabus EX 17 Quick-stops TPS was amended on to +/- 10 ft on 22 Jun 12.
[6] The "backdrop technique" is a method where the aircraft height above the ground is maintained with the collective lever by visually lining up a point on a marker in the middle distance with a point in the far distance.
[7] Although the aircraft has maintained height, the finishing height above ground may differ from that at the start, owing to variations in terrain.
[8] Fig 2 & 3 have been redacted to remove names.

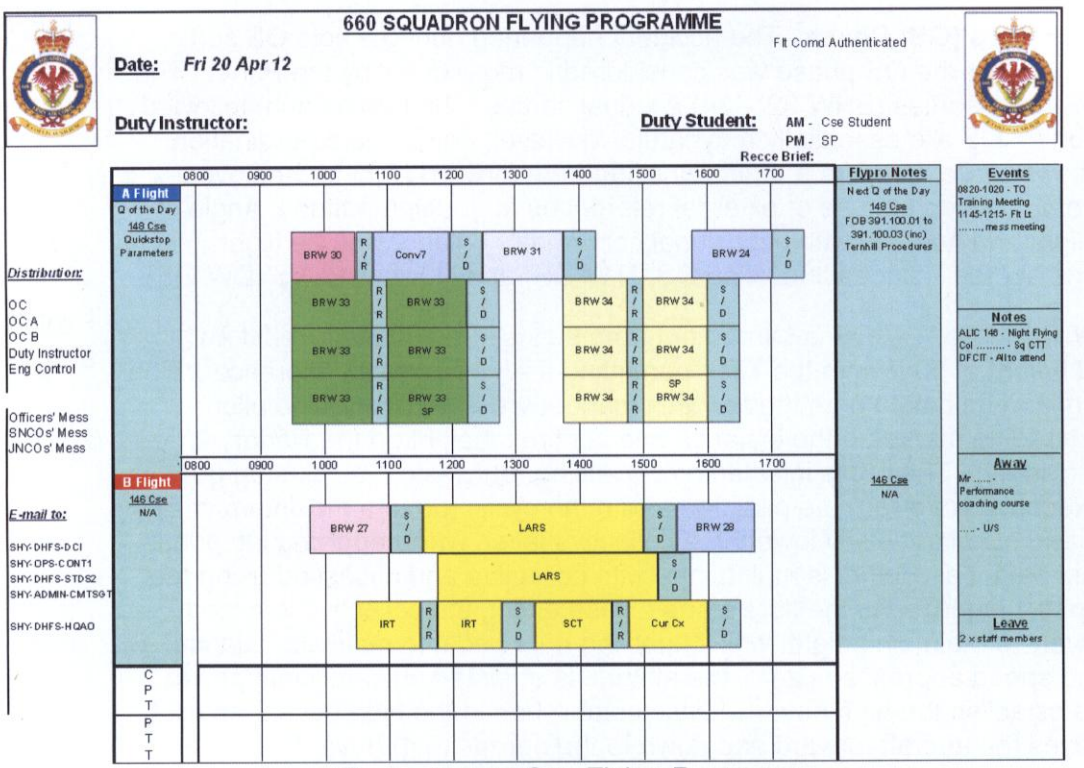


*Figure 2 - 660 Sqn Flying Programme*

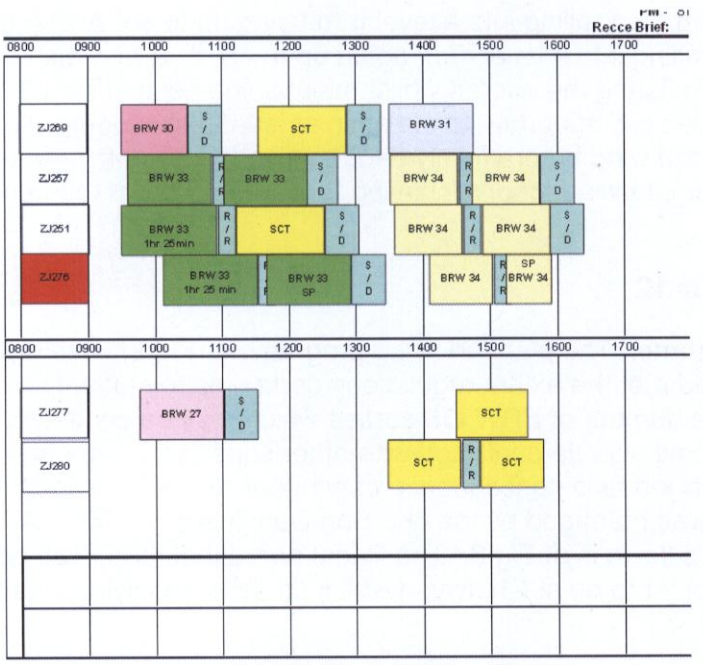


*Figure 3 - 660 Sqn Sorties Flown*

1.4.21. **Time Pressure**. The student reported that he was '*pushed for time*' prior to the accident sortie and commented in interview that he likes routines and would normally sit and mentally prepare prior to a sortie. The Panel sought to understand the cause of the time pressures. Witness 1 Annex F

a. **BRW 33 Sortie Delay**. Programme changes resulted in the SP's BRW 33 sortie getting airborne at 1115 hrs. The late return of this sortie reduced the preparation time available to the SP, for his next sortie, by approximately 30min from 2hr 30min on the original programme (Fig 2). To mitigate the impact of the Witness 1, 2 & 4 Exhibit 1, 8

delay, his primary QHI directed the SP to sign the aircraft Sector Record Page (MF-08) at the same time as the instructor was signing in. In addition, he directed the SP to get some lunch prior to conducting a combined BRW 33 debrief and a BRW 34 briefing.

b. **Additional Tasks**. Following the authorisation and out-brief of his BRW 34 sortie, the SP conducted a 'stick-hold'. The SP also spent a period of time at the operations desk as duty student, but the Panel were unable to determine the length of this time period due to an incomplete Sqn ops log. Witness 1, 4, 5 Exhibit 7

c. **Early Return**. ZJ276 returned from its first sortie of the afternoon 5min earlier than the SP expected. Witness 1, 3 & 5 Annex F Exhibit 4, 8 & 9

The HF report states that the SP was experiencing some time pressure and may have had suboptimal task readiness. The Panel considered that the 2hr available to the SP prior to BRW 34 was sufficient sortie preparation time. Furthermore, the Panel reviewed the CVR and heard the SP discussing his plans for that evening and the weekend during the rotors running crew change and a relaxed demeanour during the initial part of the sortie. Time pressure, and critically a perception of time pressure, is an air safety issue; however, on this occasion although the SP's routine had been interrupted, the Panel could find no evidence to support the SP's perception of time pressure and on balance, the Panel concluded that time pressure was **not a factor**.

1.4.22. **Student Duties**. The DI was not programmed to fly during their duty period but the duty student was. Scheduling someone for Duty Student during the same period as they are programmed for syllabus sorties was suboptimal. Students need sufficient time to plan and prepare for their sorties without diversions. The Panel concluded that the programming and scheduling of the Duty Student was an **other factor**. Exhibit 1, 27 Witness 1

## Aircraft Maintenance History & Preparation for Flight

1.4.23. **Squirrel HT1/HT2**. SERW Training is undertaken on Squirrel HT1 and HT2 aircraft (Eurocopter designation AS350BB) operating as a Military Registered Civilian Operated Aircraft (MRCOA) within the AOA of 22(Trg)Gp. With the exception of the part task trainer, which is owned by DHFS, all DHFS aircraft and synthetic training equipment are owned by FBH, a consortium of Bristow Helicopters and FR Aviation. FBH also contracted to provide all maintenance and support services in addition to 40% of the flying instructional staff and all the ground school and simulator staff. Annex E Exhibit 71

1.4.24. **Engineering Documentation**. Post-accident, all engineering documentation relating to ZJ276 (Civil Ser No 3014), including historical archive documentation, were impounded. The Panel sought to determine whether the aircraft condition, serviceability and maintenance were factors in the accident. ZJ276 was used on 20 Apr 12 for 2 x BRW 33 sorties and a BRW 34 sortie prior to the accident flight. Exhibit 8, 9 & 28

a. **Aircraft Documentation**. ZJ276 aircraft documentation was checked to confirm that engineering components were within stipulated life limits, the scheduled maintenance was correct and that general engineering standards had been adhered to. The Panel concluded that the aircraft was serviceable and airworthy prior to the final sortie and aircraft serviceability was **not a factor**. Exhibit 29

b. **Auto Pilot (AP) Functional Checks**. Prior to the first BRW 34 sortie the pilot (a student) identified a potential fault with the AP during pre-flight checks. The pilot's instructor deemed that the AP system was operating as expected. The aircraft was serviceable on completion of the pre-flight checks and the AP was **not a factor**. However, **the Panel made the observation that** the serviceability criteria for the AP was not clearly defined within the Aircrew Manual or Flight Annex A

Reference Cards (FRCs).

c. **Aircrew Accepted Faults**. As part of the aircraft Continuous Charge process, DHFS at RAF Shawbury utilise a locally-produced Minor Acceptable Fault (MAF) certificate for the recording and handover of aircrew accepted faults. The use of this bespoke form was not directed in the Squirrel Support Policy Statement by the Special Projects Multi-Air Platforms (SPMAP) PT. However, the user instructions and processes being applied are in common with those used for MOD aircraft on continuous charge that are managed through the Mod Form F700 series. The Panel considered the use of the MAF certificate provided an improvement to Flight Safety and was in line with best practice. The Panel **made the observation that** the use of the MAF certificate was not authorized by the SPMAP PT. Exhibit 30

d. **External Checks**. The SP stated that when taking over the aircraft for his solo sortie the SP checked the starboard side of the aircraft whilst 'the stick holder' checked the port side. As the Aircraft Commander and the only crew member on his sortie the SP should have completed the external checks on both sides of the aircraft prior to the crew change. The Panel made the **observation** that the SP only checking one side of the aircraft was a **breached defence**. Exhibit 20 & 31 Witness 1

## Supervision & Authorisation

1.4.25. **Overall Supervision of Flying Training**. At the time of the accident the Chief Instructor (CI) was the Executive Flying Supervisor (EFS) and responsible for overall supervision of flying. He conducted this role from his office within the DHFS HQ which was displaced from the main flying activity. Other key players within the supervisory chain included: the ATC supervisor, Sqn DIs, Stn Duty Ops Officer and Duty Met Officer. Exhibit 20 Witness 8

1.4.26. **Other Establishments**. Other flying training establishments employ a system whereby a suitably qualified flying instructor, with delegated authority / responsibilities for the immediate supervision, coordination and flight safety of flying activity, is normally located in ATC. The Panel **made the observation** that this system is not employed at DHFS. Exhibit 20, 32 & 58

1.4.27. **660 Sqn DI.** The 660 Sqn DI is responsible to the EFS for the supervision and efficient control of the Sqn's flying programme. He is specifically authorized to take sortie out-briefs. The DI was correctly trained, authorized and experienced to carry out the role as assigned. The Panel concluded that the 660 Sqn DI carried out his duties as required and this **was not a factor**. Witness 4 Exhibit 20, 27 & 33

1.4.28. **Authorisation**. The station policy for detailing powers of authorisation were contained within the FOB. Individual powers of authorisation, approved by Cmdt DHFS, were contained within a matrix held on the Sqn ops desk. Exhibit 20 & 34

a. **Self-Authorisation**. The SP's QHI self-authorized BRW 33. The Panel noted that self-authorisation was an established norm at DHFS for routine instructional sorties. RA 2306 (1) states: '*Independent authorization, rather than self-authorisation, is encouraged…*', however, TGOs and FOB do not detail any additional direction relating to self-authorisation and therefore do not provide sufficient guidance on the matter. The Panel concluded that the acceptance of routine self-authorisation removed a layer of defence within the supervisory chain and was an **other factor**. Exhibit 8, 20 & 34

b. **SP Authorisation**. The SP was briefed and authorized to conduct the sortie in accordance with BRW 34 and extant direction. The Panel found that the SP's Exhibit 8 & 34

BRW 34 sortie was correctly authorized and was **not a factor**.

1.4.29. **SP Qualification**. The Panel determined that the SP was on duty, suitably rested, medically fit, current and had completed the requisite training and was qualified for the planned sortie. The Panel found that the SP was acting in the course of his duties and this was **not a factor**. Witness 1 Exhibit 6 & 8

1.4.30. **Overview of Chetwynd**. Chetwynd field (Fig 4) is an unmanned, large grassed area owned by the MOD and used extensively by DHFS and CFS(H) for teaching and practicing RW manoeuvres. The field is divided into 2 areas, Area Left and Area Right, as seen from the approach. The areas are defined by the landing direction (° magnetic) which passes through the wind sock at the centre of the field. The circuit capacity (normally 3), specific operating areas and procedures are detailed within the FOB. In particular, the total number of aircraft permitted in each area during DW operations is reduced to 2 when any aircraft is flown by a solo student / CFS mutual pair or when conducting BRW 32 & 33. Aircraft are in receipt of a Basic Service[9] from ATC Ternhill and aircraft operating singularly at Chetwynd should make "ops normal" calls every 20min. Exhibit 35

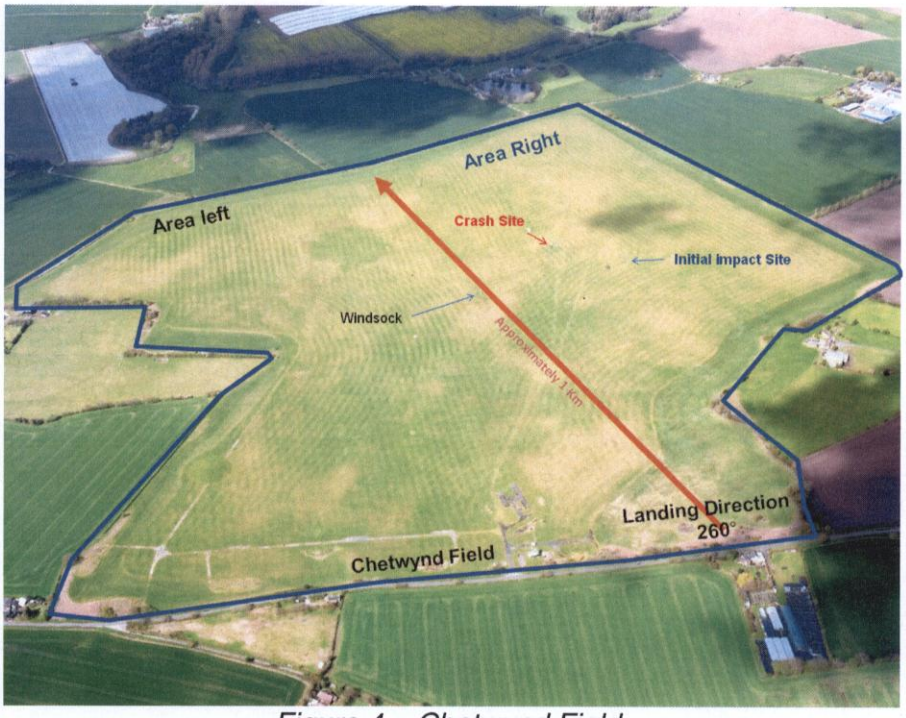


*Figure 4 – Chetwynd Field*

1.4.31. **Initial Phase of Sortie**. The SP assumed command of ZJ276 following the planned rotors-running crew change. Witness 1

a. The pilot executed the first phase from RAF Shawbury to Chetwynd as planned and briefed. Witness 1 Exhibit 4

b. Chetwynd Circuits: One aircraft was established in Area Right when the SP joined the same area for an ITW QS. There were also 2 aircraft operating in Area Left, one of which was a staff SCT sortie that departed after the SP called established. This left 3 aircraft operated by solo students at Chetwynd. Witness 1, 3, 6 & 7 Exhibit 1 & 5

c. The SP conducted a total of 8 QS without incident although he appears to have overshot the 3rd and 6th QS when he reported he felt unhappy with "*how the* Witness 1

[9] A Basic Service is an Air traffic Service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety.