PART 1.3 – NARRATIVE OF EVENTS

All times local (Zulu plus 4.5 hours).
Glossary of abbreviations for all parts provided at the end of Part 1.3.

BACKGROUND

1. **Overview**. Operating as part of Joint Helicopter Force (Afghanistan) (JHF(A)), Chinook HC2A ZA708, was conducting a high priority resupply task during the early hours of 10 Aug 10. This task was in 2 phases and was planned to commence and complete at Camp Bastion, Helmand Province. Phase one was the delivery of a 2.5 tonne under-slung load (USL) and 16 passengers from Camp Bastion to Nahidullah Patrol Base (PB) in the Task Force Helmand Area of Operations (TFH AO). Phase 2 involved a refuel at Camp Bastion followed by the transportation of a 3.5 tonne USL to the helicopter landing site (HLS) at PB Bahadur (also in the TFH AO). Both phases were originally planned to take place during the hours of darkness, in a period of low ambient light levels. Delays incurred during phase one had put the aircraft (ac) 10 minutes behind schedule, which, with the advancing dawn, resulted in increased light levels for the latter part of the sortie. During the USL and passenger drop-off at PB Nahidullah, the crew encountered significant dust recirculation, but were still able to complete this phase of the task. During the second USL drop-off at PB Bahadur HLS, the ac again entered a large recirculating dust cloud. Shortly after the load was released, the port side of the ac impacted the PB compound wall, closely followed by the collision of the aft rotor blades with a sangar structure within the compound. The ac then regained a level attitude, climbed away from the compound and clear of the dust cloud. The crew assessed an immediate landing was necessary, transmitted a mayday call and conducted a successful running-landing into a field 260m from the HLS. As a result of damage to the compound wall, the roof of an attached building collapsed, inflicting very serious injury to a serviceman of the 1st Battalion Royal Ghurkha Rifles, attached to 1st Battalion Mercian Regiment. He was evacuated to the UK but subsequently died of his injuries on 12 Aug 10.

Witness 2
Exhibit 8
Exhibit 28
Exhibit 1
Annex A
Witnesses 1 & 2
Exhibit 35 & 36
Exhibit 53

2. **Ac History**. ZA708 is a Mk2A Chinook Helicopter under the Aircraft Operating Authority (AOA) of Joint Helicopter Command (JHC). At the time of the accident, it was deployed to Afghanistan as part of JHF(A) and had been in Theatre since 21 May 10. At the initial mission launch time, the ac had flown 8955.55 flying hours and was 139 flying hours away from its next scheduled 'depth' service (conducted every 800 flying hours). The ac was due to enter a modification programme to upgrade the engines from the T55-L-712F type to the improved T55-L-714A. This was part of a fleet-wide modification program to bring commonality across the Chinook fleet, reduce long term operating costs and to improve performance.

Annex C

3. **Crew Background**.

a. The ac captain and Chinook flight commander (flt cdr) completed flying training to an overall standard of high-average in 2003. As a Limited Combat Ready (LCR) Chinook pilot, he completed operational tours in Iraq and the Falkland Islands before being awarded Combat Ready (CR) status in 2004. He also took part in Op MATURIN, providing earthquake relief support in Pakistan, for which he received the plaudits of his sqn cdr. Assessed as above average on his last three periodic

Exhibit 71

summaries, he has been a training captain, a squadron Standards Officer (StanO) and a Chinook flying display captain. Recently promoted to sqn ldr, this was his fifth deployment on Op HERRICK, but first as flt cdr. He was sat in the right-hand cockpit seat and operated as the ac captain and Handling Pilot (HP) during the accident sortie.

b. The co-pilot, completed flying training to an average standard in 2006 and initially served as a Puma HC1 pilot. Awarded CR status in 2007, he was assessed as having a high-average standard of flying ability in his final 2 periodic summaries before being posted to the Chinook Operational Conversion Flight (OCF) in 2009. He was assessed as average or high-average during all phases of his Chinook conversion, was awarded LCR status and posted to 27 Sqn in 2010. This was his first deployment on Op HERRICK. He was sat in the left-hand cockpit seat and acted as Non-Handling Pilot (NHP) during the accident sortie. Exhibit 71

c. The No 1 Crewman was a foreign one-way exchange Crewman experienced on other types. He completed the Chinook OCF to a high to above-average standard and was awarded LCR status in 2009. During the accident sortie, he moved between the cargo ramp area of the cabin and the centre-hatch. Exhibit 71

d. The No 2 Crewman graduated from the Chinook OCF to a high-average standard and was posted to 27 Sqn as an LCR Crewman in 2008. He deployed to Norway and achieved his Arctic Environmental Qualification, before being awarded CR status in Sep 09. This was his sixth Op HERRICK deployment. He was positioned in the right-hand cabin door, at the front of the ac cabin, during the accident sortie. Exhibit 71

4. **Deployment Background**. B Flt, 27 Sqn was deployed to Afghanistan as 1310 Flt (an expeditionary unit designation), with the ac captain as OC 1310 Flt. The ac captain, co-pilot and No 1 Crewman were approximately 8 weeks into their 10 week tour, but the No 2 Crewman was supplementing the detachment from another flt and had only been in Theatre for approximately 4 weeks. All evidence pointed to the fact that their operational tour as part of JHF(A) had been particularly arduous but successful, with several notable achievements. They had flown a total of **(S26)** hours in one month, a previously unprecedented amount of flying hours, in a typically hot Afghan summer, where temperatures regularly exceed 40° C. **(S26)**

all under the stewardship of OC 1310 Flt, the HP. The 'clear, hold and build' strategy, employed as part of the International Security Assistance Force (ISAF) counter-insurgency effort in Afghanistan, had led to an exponential increase in the number of PBs. In this instance, PB Bahadur could only be resupplied by helicopter. Witness 13, 22

5. **Previous 24 Hours**. On 9 Aug 10, the day before the accident, the crew assumed the duty of 1310 Flt Duty Crew and their duty commenced when they awoke at approximately 0300. As duty crew they were responsible for the daily running of the Flt, including admin support and flying programme management. The 2 crewmen went to the Camp Bastion catering facilities to collect flight rations for operating crews, the NHP acted as Duty Aviator and the HP was the authorising officer for the tasking crew; both the HP and NHP attended the morning brief at 0730. At 1250, the NHP was informed by JHF(A) Ops staff that an immediate air supply request (I-ASR) had been received. This I-ASR Exhibit 38 Witnesses 1-4 Exhibit 78

detailed the requirement for an urgent resupply of PB Nahidullah and PB Bahadur, to be carried out in the early hours of the next morning. **(S26)** . Due to the imperative to complete this mission and the perceived insurgent threat in the area of the PBs, it was decided by JHF(A) to complete this task in the hours of darkness. Scheduled for the Chinook Tasker 2 tasking line on 10 Aug 10, the HP decided that his crew was the most appropriately placed to conduct this exacting task. He instructed the NHP to plan the sortie for the pre-dawn period the next day. The NHP planned the sortie with the information available and in consultation with JHF(A) J2 (Intelligence) personnel, he determined that there would be a requirement for Attack Helicopter (AH) over-watch. He scheduled the sortie brief for 1630 that afternoon in order to allow for an ample crew-rest period prior to the sortie. The NHP used the **(S27)** mission software to plan the sortie and in the process noted that the image provided in the JHF(A) HLS Directory entry for PB Bahadur was orientated incorrectly and that the stated grid for the landing point (LP) was incorrect; he corrected both aspects using his **(S27)** plan. The AH crew planned their sortie in close consultation with the Chinook crew. At some point, JHF(A) Ops staff were informed of a task change, which necessitated the resupply sortie being flown to Forward Operating Base (FOB) Khar Nikah, instead of PB Bahadur. The NHP's plan required only slight alteration to incorporate an approach to FOB Khar Nikah from the North. The sortie was briefed at 1630 using the JHF(A) Joint Mission Briefing (JMB) framework. After the JMB the crews had dinner and went into crew-rest, for which a period of 8 hours was available.

Exhibit 12, 43 & 59
Witness 13
Witness 2
Exhibit 8
Exhibit 5
Exhibit 6
Witness 2
Exhibit 66
Witnesses 2 & 5

6. **Sortie Brief, Authorisation and Supervision**. The Chinook crew woke at approximately 0200 on 10 Aug 10 and met with the AH crew for a conditions check at 0230. Here, the latest J2 and meteorological data were assessed before the decision was made to launch the mission. The Bastion meteorological aerodrome report (METAR) for the sortie period stated a wind of 070° / 4 kts, visibility in excess of 10 km, a temperature of plus 30°C and no cloud at the operating level of the Chinook. The crew did not calculate any ac performance figures for the sortie although the planned payload and fuel state combinations were within normal parameters for Chinook ops at that density altitude. During the conditions check, the Chinook crew were handed a written brief, prepared by the off-going JHF(A) Watchkeeper. This brief explained that the task had reverted to the original request for the resupply of PB Nahidullah and PB Bahadur. As the NHP had originally planned for PB Bahadur, it was assessed that there was sufficient time to make this amendment to the plan without jeopardising a punctual departure from Bastion. The NHP adjusted his plan and printed amended imagery and maps for the sortie. The Authoriser was made aware of the sortie profile during the planning phase and was present during the conditions check. Using the 1310 Flt Standard Outbrief format, he signed an authorisation sheet prepared using the STARS computer program; the authorisation specified the standard JHF(A) tasking authorisation, ac registration, crew and take-off and landing times.

Witnesses 1-6
Witness 2
Exhibit 7
Exhibit 6
Witness 2
Witness 14
Exhibit 25
Exhibit 24

7. **Sortie Pre-Accident Events**. The last-minute change of plan served to compress the Chinook Crew's pre-sortie preparation time; however, the ac launched only 5 minutes late at approximately 0335, picking up the passengers and USL for PB Nahidullah from Camp Bastion passenger handling facility and the load park respectively. The ground troops at PB Nahidullah indicated the area in which they wanted the USL and passengers to be dropped by placing a **(S26)** inside the HLS. **(S26)**

Witness 1, 2, 5 & 6
Exhibit 3

. The Chinook's approach to the load drop off point was accompanied by the development of a large dust cloud, through which the crew were able to maintain visual contact with the **(S26)** Witness 1

Placing the USL on the ground successfully, the No 1 Crewman attempted to release the load using the Winch Operator's Grip (WOG); however, the ac's centre hook did not respond. The No 1 Crewman then used the manual load release system (Fig 1-1), located in the hatch area of the cabin, to successfully release the USL. Witness 3

Fig 1-1 Manual Load Release Lever in Hatch Area (Arrowed)

8. In order to drop off the 16 troops on board, the ac was re-positioned in the ground cushion to land clear of the USL. This manoeuvring was conducted in heavy recirculating dust. The ac drifted forward in the dust cloud until the front rotor disc was over the PB camp structures. Unhappy with this and suspecting that the HP was disorientated, the No 2 Crewman called '*overshoot*' to the HP, direction that can be given by any crewmember. However, the HP had instructed the NHP to turn on the white landing lights just before the overshoot call. This allowed the HP to regain sufficient hover references through the dust and he continued with the repositioning manoeuvre; the ac landed and the passengers disembarked. After departing PB Nahidullah, the No 2 Crewman suggested that the crew should discuss what had happened as he was unhappy that the HP had not followed his overshoot call. A brief discussion then ensued, with the HP stating he believed that overshooting for a further approach would have been more hazardous than repositioning the ac in the ground cushion; he further stated that immediately the white landing lights were turned on, he had regained visual references. During the return trip to Camp Bastion, the No 1 Crewman considered why the USL could not be released using the WOG and concluded that he had probably inadvertently knocked the WOG Arming Switch to its gated 'off' position. This was due to the fact that he had operated the WOG in its stowed position on the cabin wall, which is next to the WOG arming switch (Fig 1-2). The No 1 Crewman had chosen to operate the WOG in this position due to the potential trip hazard to the passengers presented by trailing the WOG's electrical cable across the ac cabin. Once on the ground at Camp Bastion, the WOG was tested and ZA708 was refuelled to a level of 1400 kg before repositioning to pick up the USL for PB Bahadur.

Witnesses 1-4
Exhibit 16
Witness 4
Witness 1
Exhibit 16
Witness 4
Exhibit 16
Witness 1
Witness 3
Witness 1 & 3

Fig 1-2 WOG in Stowed Position - Note Proximity of Arming Switch (Arrowed)

ACCIDENT SEQUENCE

9. **Use of 3-metre extension strop**. Before flight, the Chinook crew identified that the size of Bahadur HLS was particularly restrictive, with the LP being adjacent to the compound wall of the PB (Fig 1-3). For this reason, the No 1 Crewman suggested that they should use a 3 metre strop to ensure that the requirement for a Minimum Separation Criteria (MSC) of 10 ft was adhered to during the load drop-off procedure. The HP's decision to use the strop balanced the benefit of increased separation from the obstacles at PB Bahadur against the risk that during a USL drop-off in dusty conditions, the increased height of the ac caused by the 3 metre strop would make it more difficult for the crew to maintain visual hover references through the recirculating dust. Due to the briefed insurgent threat to aviation in the area of the HLS, the crew considered that only one attempt to deliver the USL was safe; if the load was not successfully dropped on the first attempt, the HP would have been reluctant to make a second approach, which may have meant the troops would go without a resupply on this occasion.

Witness 1 & 3
Exhibit 21
Exhibit 3
Exhibit 14
Witness 1& 3

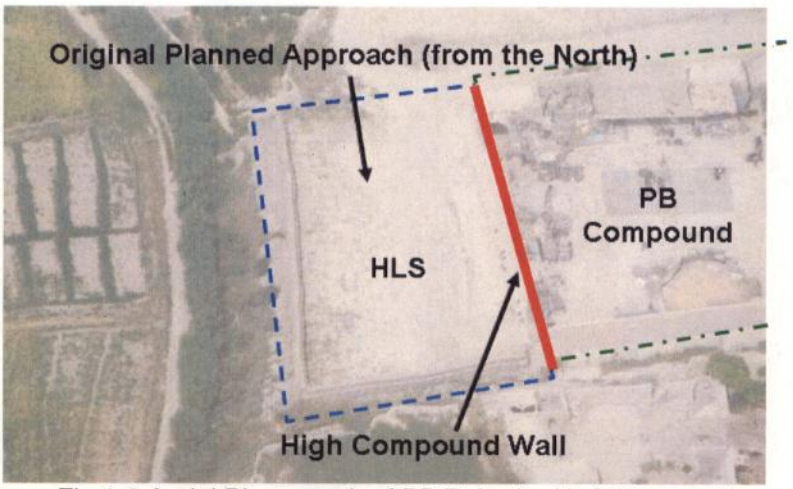

Fig 1-3 Aerial Photograph of PB Bahadur HLS (Arrowed)

10. **Transit**. The load was collected from Camp Bastion and the NHP noted that the USL cleared the ground when the ac was at a height of **(S26)**, as shown on the radar altimeter (Radalt). The Radalt 'bugs' (which determine the height at which the visual and audio low height warnings are activated) were adjusted to compensate for the height of the load and the 3 metre strop. The ac transited to Bahadur at approximately **(S26)** , during which the Chinook was advised by the AH not to route into the site from the north as planned, but to approach from the south in order to avoid an area of known insurgent activity. The NHP planned a revised route via the overhead of FOB Khar Nikah and configured the navigation system to provide a steer to PB Bahadur, using the grid reference of the LP that he had determined using **(S27)** . **(S26)** there were no further adjustments made to the Radalt bug settings for the remainder of the sortie. Routing toward PB Bahadur **(S26)** , the crew had difficulty identifying the HLS in its position close to the Helmand River, as the **(S27)** imagery differed from what they saw on the ground because it had been taken when the Helmand River was in full flood, as opposed to almost completely receded. The crew were expecting to see **(S26)** , which the ground callsign at PB Bahadur would have prepared to mark where the USL was to be placed, but

Exhibit 16
Exhibit 16
Witnesses 1, 2, 5 & 6
Exhibit 16
Witness 2
Witnesses 1 & 2
Exhibit 16
Witnesses 1, 2
Witnesses 1, 2 & 4

at no time did they see one. **(S26)**

the HLS was not identified until it was less than 0.25 nm away in the ac's 3 o'clock position, almost directly beneath the ac. **(S26)** Exhibit 16 Witness 8

. The HP had originally planned to approach the site in a north-easterly direction; however, due to the late identification of the HLS, the HP elected to make a 180 degree right turn to approach the LP on a south-westerly heading. Exhibit 16

11. **Final Task – Finals turn**. The HP initially turned to the left through approximately 20°, using 10° angle of bank (AoB), while continuously decelerating in order to position the ac for the turn. The ac then conducted a tight turn onto finals, utilising approximately up to 20° AOB, 20° nose down (Fig 1-4a) and up to 4 inches of pedal deflection (i.e. 2 inches right foot forward). The ac passed 100ft with approximately 25 kts groundspeed (GS) while still turning. Annex A Exhibit 16

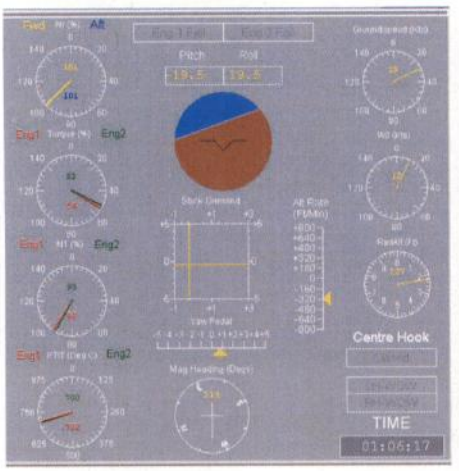

Fig 1-4a (CVFDR data) midway through finals turn.

(S26)

Fig 1-4b RNFSAIC data - approximate path flown.

12. **Final Approach**. During the final approach, the No 2 Crewman noticed a new and un-notified wall at the northern edge of the HLS and, in order to monitor this obstruction, requested the NHP (in the LHS) to monitor the clearances from the PB compound wall to the left of the ac. The HP increased AoB to the right to approximately 25° and pitched the ac's nose up to 3°, but flew through the intended approach direction. The ac passed through 228°, with the NHP informing the HP that he was at 50 ft agl and 17 kts GS. The turn was then reversed to the left using 5° AoB and increasing the nose-up attitude to approximately 10° to regain track, before subsequently settling on a final heading of 218° and achieving zero groundspeed at the HLS (Fig 1-4b). A significant dust cloud engulfed the cockpit area, causing the HP to lose all visual references. Continuing with the USL drop-off procedure, he glanced at the instruments, namely the hover meter and Radalt. Believing the aircraft was not drifting, he continued with the descent, under the No 1 Crewman's direction, to place the USL on the ground while simultaneously attempting to re-acquire references by looking out to the front of the aircraft. The HP was unable to re-acquire any clearly-defined hover references during the remainder of the USL drop-off procedure. The NHP and No 2 Crewman lost their references before the HP, but references were not discussed during the profile by any member of the crew. The No 1 Crewman released the USL using the WOG and called Witness 2 & 4 Exhibit 16 Exhibit 1 Witness 1 Witnesses 2 & 4 Exhibit 16 Witness 4

'*load gone, clear away*'. However, this call was partially drowned-out by the No 2 Crewman's call of '*Overshoot! Overshoot! Overshoot!*', as he noticed a **(S26)** marker moving rapidly away from the right-hand side of the ac, indicating that the ac was drifting left toward the PB compound wall. At the point of load release, the ac attitude was approximately 10° AoB to the left and 11° nose-up. The time span between the USL touching the ground and the overshoot call was approximately 1.5 seconds. The HP immediately reacted to the overshoot call, pulling up on the collective to demand maximum power, with Engine 1's torque peaking at 119.75% and Engine 2's torque peaking at 123.5%.

Annex A (Fig 1 & 2)
Exhibit 16

Annex A (Fig 3)

13. **Impact Events**. Approximately 1 second after the overshoot call, the lower rear left area of the ac fuselage collided with the compound wall, imparting a rate of roll to the left of approximately 45° per second. The SI Panel are of the opinion that, at this point, ZA708 satisfied the criteria required for dynamic rollover to occur. The AoB peaked at approximately 39.5° to the left. The impact forced the port chaff dispenser into the port fuel pod until it was flush with the skin (it normally extends to approximately 32 cm proud of the fuel pod), pushed the forward-firing flare dispenser forward, into the pod skin and dented the skin above the rear left undercarriage (Fig 1-5).

Annex A (Fig 5 & 7)

Annex A

Annex C

(S26)

Fig 1-5

14. The ac yawed left through approximately 40° about the impact area of the fuselage. Shortly after the roll to the left was initiated, the aft rotor blades made contact with a sangar structure within the compound, momentarily reducing the ac rotor speed (Nr) to approximately 84.75%. The Panel consider it is probable that the high blade pitch angle combined with the collision of the aft rotor blades with the sangar, acted to impart a sufficient roll moment to the ac to counteract the effect of dynamic rollover (Fig 1-6).

Annex A (Fig 6)
Annex C

Annex A (Fig 4)

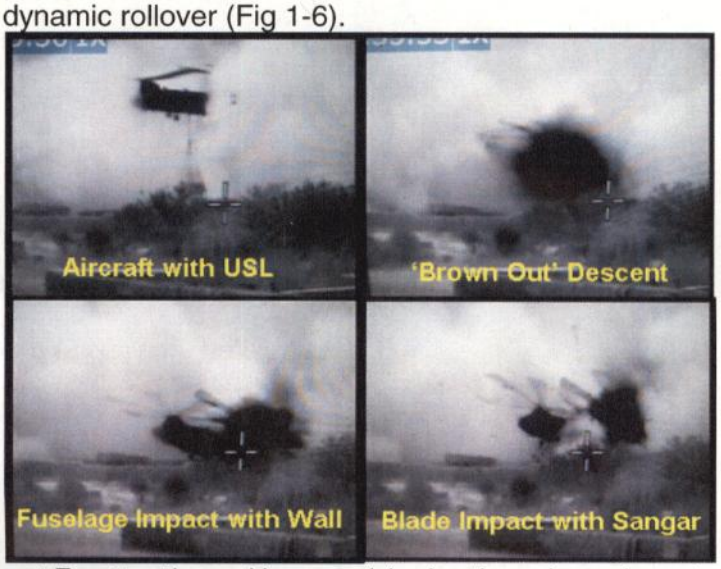

Fig 1-6 Impact Events – thermal imagery (viewing through an element of the dust)

15. **Post-Impact Events.** Shortly after the collision with the compound wall, the HP moved the cyclic to the right in an attempt to counteract the roll to the left. Following the impact of the blades with the sangar, a level attitude was achieved and, with overshoot power still applied, the ac climbed away from the PB. Footage of the accident, taken by a nearby IR camera, showed the ac shedding parts of the rear blades as the overshoot was carried out. Feeling extreme vibration through the controls and airframe, but finding that the ac was still in a flyable condition, the HP reports glancing into the cockpit and seeing a significant torque split and several illuminated Caution Advisory Panel (CAP) captions. Due to the severity of the vibration in the cockpit, the HP was unable to ascertain which captions were illuminated, although he reported that they may have been in the area of the transmission-related captions. From analysis of the CVFDR data, the SI Panel has found that only the 'L FUEL PRESS' caption and 'ENG EMERG PWR' caption were illuminated at this point. Due to the lack of crash-attenuating seats for Chinook crewmen, the No 2 Crewman secured himself by holding on to the **(S26)** support beam and was unable to offer any further assistance to the HP. The No 1 Crewman secured himself by holding on to the cabin under-seat struts whilst lying on the floor. After his own assessment of the ac's state and following an instruction to 'land' from the NHP, the HP stated that he was going to have to make a forced landing. The HP executed a safe running landing into a suitable field, approximately 260m away from PB Bahadur on a bearing of 165°. The No 1 Crewman instructed the NHP to pull back the Engine Condition Levers (ECLs) to the 'stop' position, immediately the wheels touched the ground, which he did. With the rotors decelerating, the HP brought the ac to a stop using the brakes and then applied the rotor brake.

Annex A (Fig 1)
Exhibit 16
Exhibit 1
Witness 1
Annex A (Fig 8)
Exhibit 49
Witness 1
Exhibit 16
Exhibit 36
Witness 3

16. **Post-Impact Events at PB Bahadur**. One serviceman was sleeping within the building and was buried by rubble from the collapsed roof and wall (Fig 1-7). All PB personnel started to excavate him using bare hands and shovels. Once his head was uncovered the medic applied first aid and then clearance of the rubble continued. It then took 40 minutes to fully extricate him from the debris and he was evacuated from the site at 0544, arriving at Camp Bastion Hospital at 0556.

Exhibit 57

Fig 1-7 Collapsed Roof of Accommodation Building

17. **Post-Accident Escape and Survival. (S26)**

Witness 2

The HP exited the cockpit into the cabin before returning to turn off the cockpit lights. Believing themselves to be in a high-threat environment, the NHP and both Crewmen immediately manned the two **(S26)** . The No 2 Crewman established communications with the escorting AH **(S26)** . As it was still dark, the crew initially used their Night Vision Devices (NVDs) to scan

Witness 1
Witnesses 3 & 4
Witness 3, 5 & 6

for insurgent forces. As soon as light levels had increased sufficiently to see with the naked eye, the HP and the crewmen elected to destroy their NVDs in order to deny the capability to the insurgents in the event of capture. The crew rotated through their defensive positions to allow each member to prepare their personal kit before extraction. The NHP ensured that no classified materials were left behind. Witnesses 1-4 Witness 2

18. **Extraction from the Emergency Landing Site**. The escorting AH had immediately assumed the position of 'On Scene Commander' following the forced landing. The AH crew requested the launch of the Very High Readiness AH from Camp Bastion in order to provide increased protection to the Chinook crew. They also liaised with the ground forces in the area and discovered that there was a patrol multiple accommodated in a nearby compound, to the south of the emergency landing site. The AH crew then coordinated the movement of the foot patrol to the downed ac in order to extract the crew. The crew were advised of the approaching friendly patrol by the AH crew, in order to ensure that the patrol was not mistaken for insurgent forces. The ground troops arrived at the ac ramp, the crew disabled both **(S26)** and then patrolled with the ground forces back to a local compound. Both the crew and the ground patrol spent several hours in the compound before patrolling back to FOB Khar Nikah at 1130, from where they were recovered by Merlin helicopter to Camp Bastion 2 hours later. Witnesses 5 & 6 Exhibit 26 & 27 Witnesses 5 & 6 Witnesses 1-4 Witness 3 Witnesses 1-4

AIRCREW ESCAPE AND SURVIVAL FACILITIES AND AIRCREW EQUIPMENT ASSEMBLIES (AEA)

19. **Personal AEA**. The aircrew were flying in fire-retardant Combat Soldier 95 (desert pattern) clothing with aircrew flying helmets. No faults were reported, but none of their clothing was tested following the accident. During the foot patrol extraction from the emergency landing site, the Crew were immediately identified as aircrew by the local population, due to the fact their desert pattern flying clothing does not match the Multi-Terrain Pattern now utilised by UK Ground Forces. Exhibit 52 Exhibit 49

20. **NVDs**. There is no evidence to suggest that the crew's NVDs were not performing to the required standard. As the HP, No 1 and No 2 Crewmen had destroyed their NVDs prior to extraction from the emergency landing site, the Panel concluded that little would be gained from removing the remaining set from Theatre for testing, especially given the scarcity of spare NVDs in JHF(A). Exhibit 52

21. **Mk 60/61 Jacket**. The crew were wearing the Mk 60/61 Jacket at the time of the accident. Due to the nature of the accident, the capabilities of the jacket and the rear crew's inbuilt restraint system were not put to the test. There is no evidence that the jackets hindered the crew's egress from the ac. The pilots were not wearing the back armour plates due to the uncomfortable sitting position they create and the restrictive size of the Chinook cockpit. Witnesses 1&2

22. **(S26)** Witness 4 Exhibit 49

23. **Escape Exits**. The crew did not require the use of any of the emergency exits. Both pilots exited the cockpit through the companionway into the cabin, where they joined the two crewmen before leaving via the rear cargo door. Witnesses 1-4

DEGREE OF INJURY

24. The panel found that:

a. **Aircrew**. No injuries were sustained by any member of the crew.

b. **Other Service Personnel**. As a result of the Chinook's collision with the PB compound wall, structural damage to the wall caused the roof of an attached building to collapse. This inflicted very serious injury to a member of the UK Task Force, who was asleep inside the structure. He was medically evacuated to the UK but subsequently died of his injuries. Exhibit 53 Exhibit 57

c. **Civilian Personnel**. There were no reported injuries to civilians.

DAMAGE TO AC, PUBLIC AND CIVILIAN PROPERTY

25. Damage to ac, public and civilian property was assessed as follows:

a. **Ac**. An initial damage assessment report was carried out by the Boeing Field Service Representative and the Mobile Ac Support Unit (MASU) Repair Officer in Theatre. This classified the damage and attempted to identify whether it was caused during the accident or by the subsequent recovery process, however the floor was not removed to assess that area of the structure. The ac was initially assessed as CAT 3 (Prov). A follow up inspection subsequently reclassified the ac as CAT 4. A structural survey using laser alignment techniques was conducted at Depth which confirmed that the ac alignment was within normal limits. Annex C Exhibit 58 Annex C

b. **Public**. The collision of the ac fuselage with the compound wall caused the collapse of a portion of the wall and of the roof of an integral building of adobe-type construction. The impact of the aft rotor blades against a 15 ft high sangar structure within the compound destroyed the wood and corrugated iron sangar roof (Fig 1-8). A **(S26)** was mounted inside the sangar with its spare barrel stored close by; the spare barrel was found to be bent, damage most likely caused by the accident. Mobile Air Operations Team (MAOT) and the SIB personnel deployed to Bahadur several days after the accident to take witness statements as well as to confirm the actual dimensions and physical state of the HLS. Witnesses 7-11 Exhibit 37

Fig 1-8 Damaged Sangar at PB Bahadur

c. **Civilian**. There was no recorded damage to civilian property.

d. **Costs**. Full repair costs for ZA708 are estimated at up to £9,000,000. This includes the following costs for equipment removed from the fuselage at the landing site: Exhibit 81

(S43)

LOSS OF, OR DAMAGE TO, CLASSIFIED MATERIAL

26. The crew of ZA708 comprehensively sanitised the ac before extraction. The ac recovery teams subsequently dispatched to ZA708 stripped it of all sensitive avionics in anticipation of the ac's denial from the insurgents through either demolition charges or the use of air-delivered munitions. The only classified items damaged in the accident were the crew's NVDs, which were deliberately destroyed to prevent them falling into insurgent hands. Witnesses 1-4 Exhibit 55

AC RECOVERY

27. **Recovery from the Emergency Landing Site**. Due to the threat, the actual impact site did not undergo a formal investigation process. However, photographs and video were taken shortly after the event both from the ground and air. None of these photographs were by trained accident investigators but did provide some detail as to what areas were damaged and to what extent. Initially a small 'down bird' team deployed to the platform to assess whether recovery was an option or if the damage, particularly to the aft Main Rotor Head, was such that it precluded it being under-slung. The team assessed that the ac would take a significant amount of time to recover to a flying capability, but was structurally sound enough to allow an air lift. This assessment was passed back to the JHF(A) Principal Ac Engineer, who deployed a second team of engineers to assist the down bird team to prepare the ac for aerial recovery by a **(S26/S27)** down bird team also returned the Data Acquisition and Processing Unit (DAPU) to JHF(A) which was in turn sent to the Royal Navy Flight Safety and Accident Investigation Centre (RNFSAIC). To bring ZA708's weight to within the under slung load capacity of the **(S26/S27)**, the engineering teams on the ground removed role equipment items, such as the weapons and ballistic armour. **(S26/27)** Exhibit 67 Exhibit 36 Exhibit 55

. The role equipment was recovered but due to the threat on the ground the engines, rotor blades and ramp were denied to the insurgents using demolition charges. Both **(S26)** were recovered. The SI Panel subsequently released the weapons to the 1310 Flt Armoury for inspection, maintenance and future use on other platforms. Exhibit 56

28. **Recovery to UK**. The ac was recovered back to the UK on 28 Aug 10 where it was subsequently road moved to Vector Aerospace Ltd in Gosport.

(S26) were retained in Theatre for fitment to ZA708's replacement ac, as they were not considered to be germane to the Inquiry.

GLOSSARY

Acronym/ Abbreviation	Explanation
ac	Aircraft
AO	Area of Operations
AOA	Ac Operating Authority
AoB	Angle of Bank
AEA	Aircrew Equipment Assemblies
AFCS	Automatic Flying Control System
agl	Above Ground Level
AH	Apache Helicopter
AP	Air Publication
ATP	Allied Tactical Publication
CAP	Caution Advisory Panel
CAT	Category
C-IED	Counter-Improvised Explosive Device
CJO	Commander Joint Operations
CO	Commanding Officer
COIN	Counter Insurgency
Comd	Commander
COMJAG	Commander Joint Aviation Group
COS	Chief of Staff
CR	Combat Ready
CRM	Crew Resource Management
CVFDR	Cockpit Voice and Flight Data Recorder
DAO	Duty Authorising Officer
DAPU	Data Acquisition and Processing Unit
DC	Direct Current
DCOS	Deputy Chief of Staff
DE&S	Defence Equipment and Support
D-FSOR	Defence-Flight Safety Occurrence Report
DNVG	Display Night Vision Goggles
DSG	Defence Support Group
EAPS	Engine Air Particle Separating System
ECL	Engine Condition Lever
EQ	Environmental Qualification
ETA	Estimated Time of Arrival
Flt	Flight
Flt Cdr	Flight Commander
FMV	Full Motion Video
FOB	Forward Operating Base
FOB	Flying Order Book
FOD	Foreign Object Damage
FS	Flight Safety
FSR	Field Support Representative
FSW	Forward Support Wing
ft	Feet
(S26)	**(S26)**
GS	Ground Speed
HF	Human Factors

HFP	Human Factors Psychologist
HLS	Helicopter Landing Site
HP	Handling Pilot
HQ	Headquarters
HUMS	Health and Usage Monitoring System
IAS	Indicated Air Speed
I-ASR	Immediate Air Supply Request
IAW	In Accordance With
IED	Improvised Explosive Device
IR	Infra-Red
ISAF	International Security Assistance Force
J2	Intelligence
JAG	Joint Aviation Group
JARIC	Joint Air Reconnaissance Intelligence Centre
JFSp(A)	Joint Force Support (Afghanistan)
JFSpHQ	Joint Force Support Headquarters
JHC	Joint Helicopter Command
JHCHQ	Joint Helicopter Command Headquarters
JHF(A)	Joint Helicopter Force (Afghanistan)
JHSS	Joint Helicopter Support Squadron
JMB	Joint Mission Brief
JSP	Joint Service Publication
kts	Knots
LCR	Limited Combat Ready
LP	Landing Point
LWT(P)	Lightweight Wheeled Tractor (Protected)
MAA	Military Aviation Authority
MAOT	Mobile Air Operations Team
MASU	Mobile Ac Support Unit
(S27)	**(S27)**
METAR	Meteorological Aerodrome Report
Mk	Mark
MMU	Mobile Meteorology Unit
MOD	Ministry of Defence
MSC	Minimum Separation Criteria
MSD	Minimum Separation Distance
MSHATF	Military Support Helicopter Aircrew Training Facility
MT	Motor Transport
MTP	Multi-Terrain Pattern
NHP	Non-Handling Pilot
nm	Nautical Miles
Nr	Rotor Speed
NVD	Night Vision Device
OC	Officer Commanding
OCF	Operational Conversion Flight
Op	Operation
ORM	Operational Risk Management
PB	Patrol Base
PCM	Post-Crash Management
PDT	Pre-Deployment Training
PIDAT	Post-Incident Drug and Alcohol Testing
PJHQ	Permanent Joint Headquarters
PPE	Personal Protective Equipment

PTIT	Power Turbine Inlet Temperature
Radalt	RADAR Altimeter
RAFCAM	Royal Air Force Centre of Aviation Medicine
RC(S)	Regional Command (South)
RC(SW)	Regional Command (South West)
RE	Royal Engineers
RFI	Request for Information
Rfn	Rifleman
RNFSAIC	Royal Navy Flight Safety and Accident Investigation Centre
RWAMPA	Rotary Wing Advanced Mission Planning Aid
SAFIRE	Surface-to-Air Fire
SES	Safety Equipment Section
SH	Support Helicopter
SI	Service Inquiry
SIB	Special Investigations Branch
SNOW	Serial Number of Work
SOP	Standard Operating Procedure
SOR	Statement of Requirement
Sqn	Squadron
Sqn Ldr	Squadron Leader
StanO	Standards Officer
STARS	Squadron Training Achievement Recording System
TFH	Task Force Helmand
TORs	Terms of Reference
TQ	Theatre Qualification
UAV	Unmanned Aerial Vehicle
USL	Under-Slung Load
(S27)	**(S27)**
WOG	Winch Operator's Grip
WoW	Weight on Wheels

~~RESTRICTED – SERVICE INQUIRY~~