

PART 1.3 – NARRATIVE OF EVENTS*W – Witness**E – Exhibit*

All times are LOCAL (GMT -7 / Pacific Daylight Time)

INTRODUCTION

1. At 1220 hrs on 7 Apr 12, a CH47 HC Mk 2 Chinook (ZA 671), operated by 27 Squadron C Flight (27C Flt) RAF, departed Naval Air Facility El Centro (NAFEC), California, with 4 crew and 3 passengers to conduct a consolidation of training flight. The crew comprised a Limited Combat Ready (LCR) Aircraft Captain (Ac Capt) and an LCR Pilot, both of whom held a Limited Desert Environmental Qualification (EQ). The rear crew were both Combat Ready (CR) and each held a Full Desert EQ, one of whom was a Master Aircrewman (MACM) Instructor (3300 hrs+). The flight authorization included simulated instrument flying (IF), cross country navigation including low-level flight, and a number of dust landings (DL) at different locations within the Yuma/El Centro desert areas. The aircraft crashed at approx 1307 hrs whilst carrying out its second DL in the vicinity of Patrol Base 5 (PB5) (32° 51.77N 114° 27.99W). There were no serious casualties amongst the crew or passengers. The aircraft suffered extensive damage, including the structural collapse of both rotor head towers, and was formally classified as Category 4 (Depth).

W 1-3, 5
E 1-4

E 5

E 6
Annex A, B

2. 27C Flt was operating from NAFEC as a part of Exercise Ventus Magnus 12 (Ex VM12). The El Centro and Yuma area are chosen for JHC Desert EQ training due to the temperature and also due to the distinct topographical similarity to Afghanistan; sandy desert with small mountain peaks jutting above it. The sand consistency is, in many places, very similar to that found in Afghanistan, and as such provides a useful introduction to brown-out conditions likely to be found in tactical landings away from MOBs and FOBs in Afghanistan. The aim of the exercise was to conduct Environmental Training and some gunnery sorties prior to deployment on Op HERRICK in Jun 12. 27C Flt began to arrive on detachment on 23 Mar 12, as the 3rd tranche of RAF Chinook Force personnel to detach to the area on Ex VM12.

E 7

CREW BACKGROUND

3. **Aircraft Captain (Ac Capt).** The Ac Capt was acting as the Non Handling Pilot (NHP) in the left hand seat (LHS). He was a newly qualified LCR pilot graduating from the Operational Conversion Unit (OCU) on 28 Nov 2011. His flying experience to the date of the accident is shown in Figure 1. This was his 5th sortie during the Ex VM12 deployment.

E 2, 8

Aircraft Groups/Types		Day			Night			Total	Capt	IF	
		1st	2nd	Dual	1st	2nd	Dual			Sim	Act
Fixed Wing Piston		10:20		68:00				78:20	10:20	3:20	2:50
Rotary Wing	Squirrel	5:00		72:30	0:15		4:00	81:45	5:15	6:20	1:05
	Griffin	1:00		81:15			8:35	90:50	0:30	3:55	1:45
	Chinook	27:50	38:45	57:55	8:55	16:30	17:00	166:55	7:30	9:20	2:55
Totals		44:10	38:45	279:40	9:10	16:30	29:35	417:50	23:35	22:55	8:35

Figure 1 – ZA671 Ac Capt Flying Summary

4. **Handling Pilot (HP).** The HP was seated in the right hand seat (RHS). He

E 1, 8

RESTRICTED – SERVICE INQUIRY

was also a newly qualified LCR pilot graduating from the OCU on 28 Nov 2011. His flying experience to the date of the accident is shown in Figure 2. This was his 5th sortie during the deployment.

Aircraft Groups/Types		Day			Night			Total	Capt	IF	
		1st	2nd	Dual	1st	2nd	Dual			Sim	Act
Fixed Wing Piston		20:20	0:45	120:50				141:55	20:20	5:35	4:25
Rotary Wing	Squirrel	6:55		72:15	0:15		3:50	83:15	7:10	6:20	1:10
	Griffin	1:10		79:00			9:00	89:10	0:30	3:55	
	Chinook	29:45	41:50	52:30	9:00	19:10	15:15	167:30	7:10	8:20	2:55
Totals		58:10	42:35	324:35	9:15	19:10	28:05	481:50	35:10	24:10	8:30

Figure 2 – ZA671 HP's Flying Summary

5. **Aircrewman No 1 (Acmn 1).** Acmn 1 operated from the rear of the aircraft. He was an experienced A2 Qualified Helicopter Crewman Instructor (QHCI) having returned to the Chinook Force from an instructional tour at RAF Shawbury in Jul 2010. He was CR and his flying experience is shown at Figure 3. This was his 8th sortie during this detachment.

E 3, 8

Aircraft Groups/Types		Day	Night	Total
Rotary Wing	Squirrel	7:00		7:00
	Griffin	900:00	84:00	984:00
	Chinook	1951:35	359:35	2311:10
Totals		2858:35	443:35	3302:10

Figure 3 – ZA671 No 1 Crewman's Flying Summary

6. **Aircrewman No 2 (Acmn 2).** Acmn 2 operated from the front of the aircraft. He was an experienced CR crewman and his flying experience is shown at Figure 4. This was his 10th sortie on this detachment.

E 4, 8

Aircraft Groups/Types		Day	Night	Total
Jet Mk1	Dominie T	18:00		18:00
	Griffin HT-1	135:40	9:50	145:30
	Chinook HC2	858:20	209:00	1067:20
Totals		1012:00	218:50	1230:50

Figure 4 – ZA671 No 2 Crewman's Flying Summary

EVENTS PRIOR TO THE SORTIE

7. **Crew Activity Prior to the Sortie.** In the 24 hrs preceding the accident the crew conducted the following activities:

~~RESTRICTED - SERVICE INQUIRY~~

- | | |
|---|--|
| <p>a. NHP / HP. The NHP/HP had last flown on the night of the 3 Apr 12, conducting night DL at Holtville airfield under the supervision of a 27C Flt Training Captain (TC). The day prior to the accident had been spent in ground briefings and planning for the sortie. The pilots were staying at a hotel in El Centro and were well rested. No alcohol had been consumed during the previous 24 hrs. They both ate breakfast at the hotel before arriving at NAFEC at 1045 on 7 Apr 12.</p> | <p>W 2, 5
E 8</p> |
| <p>b. Aircrewmen. Both crewmen had completed a gunnery sortie the previous night between 1900-2210. The purpose of the sortie was to re-qualify to operate the M60 and M134 weapons, which was not considered to be a taxing sortie. Both crewman returned to the hotel by 2300 and had an uninterrupted nights sleep. No alcohol had been consumed during the previous 24 hrs. They both ate breakfast at the hotel at approximately 0830, before arriving at NAFEC at 1045 on 7 Apr 12.</p> | <p>W 1, 3 E 8</p> |
| <p>8. ZA671 / 7 Apr 12 Sortie Generation. The sortie was generated the previous day when the HP/NHP identified a space in the proposed flying programme. Initially they approached the 2IC of the Flt to gain his permission to add another sortie as an LCR/LCR crew. This was subsequently discussed with the Flight Commander (Flt Comd). He gave guidance on sortie content before giving approval. The Flt Comd's intent was that the flight would develop their captaincy skills. However, the HP/NHP aimed to consolidate their dust landings skills as well as build flying hours in preparation for deploying to Op HERRICK in Jun 12. A Squadron Training Achievement Recording System (STARS) "plaque¹" was raised by the 2IC for the flight. Two aircrewmen were detailed to fly the sortie at a later point that evening. The MACM (as Acmn 1) was a late addition to the sortie, due to one of the original crewmen being reallocated to another sortie to complete some mountain flying training. The decision to take passengers was made on the morning of 7 Apr 12.</p> | <p>W 2, 4, 5, 8

W 1</p> |
| <p>9. Sortie Planning. The sortie was planned on a mobile AMPA computer the previous day. The sortie content had been decided upon by the front seat crew following conversation with the Flt Comd; the rear crew had limited input into the planning of the sortie. The HP/NHP wanted to achieve a range of flying tasks during the sortie that included 15 min of IF flying to maintain the HP's currency, 4 DLs, low level flying along the Colorado river, a <i>stack</i> landing (rear wheels-on only) and a refuel at Imperial Air Station before returning to NAFEC. They created a flying route that would encompass all the sortie requirements, as well as being an enjoyable flight. The landing sites PB PIMON, PB5 and PB1 were selected from the Ex VM12 Helicopter Landing Site (HLS) Directory due to their proximity to the Colorado river, with a further dust landing at Holtville (a disused airfield used for desert landing training). The route is shown in Figure 9. The sortie was due to take off at 1215 and return at 1415.</p> | <p>W 2, 5, 8
E 5, 6, 9-14</p> |
| <p>10. Passenger Selection. The decision to take passengers during the flight was made on the morning of the flight by the crew, as the content of the flight was deemed suitable by them to provide flying experience to ground crew. Flights were offered to the RAF Operations Sergeant, who had arrived in El Centro the previous day, and to any Army Air Corps personnel from Ex LV 12, who were free. Two Airtroopers jumped at the opportunity for a flight, as both were considering becoming aircrewmen.</p> | <p>W 1-3, 5

W11
W 10,12</p> |

¹ Opening a "Plaque" is akin to opening a register entry - it delineates a sortie to be flown later, and allows aircraft and aircrew details to be added at a later time.

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|--|---|
| <p>11. Flight Authorization. A flying brief was conducted at 1120 by the crew in accordance with Chinook Standing Operating Procedure (SOP)². The Duty Authoriser (DA) was the Flt Qualified Helicopter Instructor (QHI). The brief was conducted in good time and was thorough. The route was prepared and briefed by the NHP; the aircraft performance figures by the HP. The following details were discussed:</p> | <p>W 1-3, 5, 7</p> |
| <p>a. Meteorology (Met)/Air Traffic Control(ATC). The HP briefed the Met using the US Air Force (USAF) supplied Meteorological Actual Report (METARs) and Terminal Area Forecast (TAF). The visibility was forecast to be 10km or greater with no significant weather to affect the sortie. The wind was forecast to be between 6-8kts from a northerly direction and the temperature and dew-point were given as 28°C and -18°C respectively. Although ATC was closed due to the sortie being conducted out of NAFEC opening hours, the flight was planned iaw Joint Helicopter Force (United States) (JHF(US)) Flying Order Book (FOB) and Memorandum of Understanding (MOU) between Commander NAFEC and 18/27 Squadron (dated 21/2/12), which gave direction concerning use of the facility when closed for US operations.</p> | <p>E14</p> <p>E15, 16</p> |
| <p>b. Warnings. No published Notice to Airmen (NOTAMs) affected the planned sortie.</p> | <p>E17</p> |
| <p>c. Planned Execution. The aircraft was planned to depart NAFEC at 1215 on a southerly heading. Initially the aircraft would operate at low level, before conducting a tactical climb to 2000ft to conduct 15 minutes of IF. The aircraft would then descend to low level, utilizing a tactical descent, to conduct a zero speed DL into PB Pimon. Upon departure, the aircraft proceeded north east to fly down the Colorado River at 50' above ground level (agl) to landing sites PB 5 and PB1, route to a rock stack to conduct a rear wheels on landing, before conducting a further DL at Holtville. Refuelling was planned at Imperial airfield before the aircraft returned to NAFEC.</p> | <p>E 5, E 9-14</p> |
| <p>d. Performance. The aircraft All Up Mass (AUM) of the aircraft was 18.6 tonnes on take off. The temperature, pressure altitude and performance were all correctly calculated to be within the capability of the aircraft throughout the complete evolution. (To note, at the time of accident the AUM was 17.6 tonnes).</p> | <p>Annex A</p> |
| <p>e. Currency. All crew members believed (and briefed the DA) that they were current to conduct the sortie. The HP had identified that he needed to conduct 15 minutes of IF to remain current. The Inquiry revealed that both the HP/NHP were actually uncurrent at point of authorisation.</p> | <p>W 1-3, 5, 7</p> <p>E 1-4, 18, 27</p> |
| <p>12. Acmn 1 raised a concern regarding the inclusion of the stack rear-wheel landing, as he believed the HP/NHP had not conducted any of the LCR to CR conversion mountain training sorties, albeit they had been trained in mountain flying techniques during their OCF. After deliberation, the DA concluded that as the manoeuvre would be conducted on a stack at 300' agl with wind at 6kts, no mountain flying techniques would be required. The sortie was duly authorized.</p> | <p>W 1, 7</p> |
| <p>13. The DA made 2 further points during the brief, neither of which had any bearing on the accident:</p> | <p>W7</p> |

² Chinook Standard Operating Procedures Issue 6 A18.

- a. The NHP should brief both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) transit emergencies as they were intending to conduct simulated Instrument Flying.
- b. The LH nose box oil pressure drops during long transits at medium altitude at high power settings.

14. **Passenger Briefing.** The passengers were authorized by 27C Flt Comd and they were given a thorough safety brief by Acmn 1. This included a brief on the Mk15 passenger helmet, dress, hand signals, use of the dispatcher harness / seatbelt and emergency procedures.

W 1, 8, 10-12
E 5

THE SORTIE

15. **Aircraft Pre-Flight Checks.** The crew walked out to the aircraft in good time. The aircraft walk-round was conducted by Acmn 2 and the HP. The NHP signed for the aircraft on the Aircraft Maintenance Log (F700) documentation.

W 1-3, 5, 7

16. **Aircraft Start-up and Taxi.** The crew were well prepared / organised and walked to the aircraft slightly early. The passengers were seated in the rear of the aircraft. The aircraft was started at 1150 but the sequence was halted due to a FADEC³ 2 caption illuminating as Engine No 2 was started. The crew consulted the Flight Reference Cards (FRCs) and Acmn 1 sought engineering advice. The aircraft was completely shut down including the external battery, and the 'Pri Cont' and 'Rev Cont' circuit breakers on the No1/No2 power distribution panels were pulled and reset on advice from flight engineers. The fault cleared when the engine was restarted. The aircraft taxied to the ramp, ready for departure at 1220. The passengers were initially seated in the rear of the aircraft. All take off calls were transmitted blind as the airfield ATC was closed.

W 1-3, 5, 7

17. **Pre-Accident Airborne Events.** A normal departure was briefed; however once on the aircraft Acmn 1 suggested that the crew should take the opportunity to practise a running take off. A successful running take-off was completed from Echo taxiway at 1220. Initially the aircraft routed out at low level to the South, before turning East after approximately one mile at the VORTAC⁴ Beacon. They then conducted a tactical climb to level at a height of 2000'. The aircraft then turned to the east before the HP conducted simulated IF whilst remaining VFR. Passenger 1 was re-seated to the jump seat by Acmn 2 and Passengers 2/3 remained seated in the rear of the aircraft until Acmn 1 asked permission to lower the ramp allow them to view the flight from the ramp. This was granted by the Ac Capt.

W 1-3, 5

W11
W 10, 12

18. Six miles before reaching PB Pimon the aircraft descended to low level utilizing a tactical descent. Landing checks were completed by the NHP and the landing site was briefed by Acmn 2. The crew elected to conduct an aerial recce orbit at 100-200' before conducting the DL. The passengers returned to their seats. The landing was conducted iaw Chinook SOP 21⁵. Figure 5 shows the Cockpit Voice and Flight Data Recorder (CVFDR) transcript from the approach and DL executed at PB Pimon.

W 1-3, 5
E 19

E 26

³ FADEC – Fully Automated Digital Engine Control.

⁴ VORTAC – VHF Omnidirectional Radio Range Tactical Air Navigation Aid.

⁵ Chinook Standard Operating Procedures Issue 7

Figure 5 – CVFDR Recording for PB Pimon Landing.

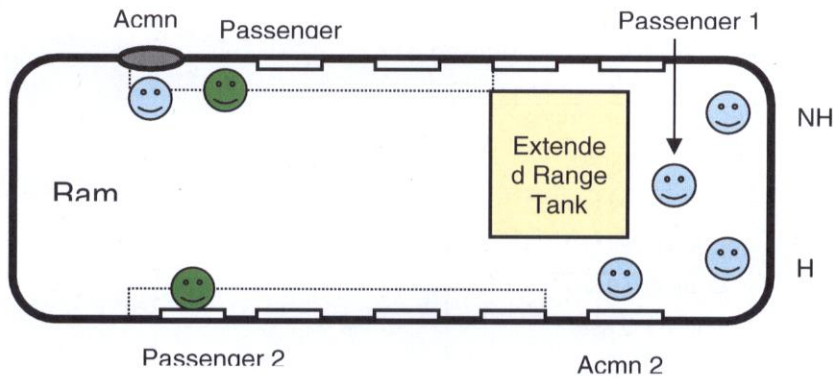
Crew Position	CVFDR Voice Recording
NHP	"100 feet, 29 knots, bugging 40"
Acmn 2	"Roger, 40"
NHP	"30 knots, 100 feet"
HP	"Happy running straight"
NHP	"Good gates"
NHP	"95 knots...sorry, 30 knots, 95 feet"
HP	"And starting approach"
NHP	"Roger"
Acmn 2	"Clear forward and down"
NHP	"75, 27 very slightly fast"
NHP	"50, 20"
RADALT	Audible warning tone
NHP	"Good"
HP	"Cancelling...continuing"
Acmn 2	"30, 20, 15, 10, 5, 2, aft on, front on, running straight"
HP	"That wasn't as dusty as I thought it would be...that's all right"

19. The landing was successful albeit with longer than normal run-on. Before the aircraft lifted, Acmn 1 prompted the crew to conduct a de-brief of the landing. He commented that the approach was slightly fast, resulting in a 6-8m run-on, and that a high rate of descent (ROD) had developed towards the bottom of the approach. He also commented that Acmn 2's talk down was slightly late as he called "3" as the rear wheels touched down. This was possibly due to the high ROD in the latter stages. Both the HP and Acmn 2 agreed with the comments in the debrief. The HP acknowledged that his second stage flare was late and he intended to start the flare earlier to try to reduce the run-on at the next landing.

W 1-3, 5, 10,
12

20. Once the de-brief was complete, the HP conducted the pre-take off checks and the aircraft lifted to approx 300-400', heading to the north east towards the Colorado River. The aircraft then descended to low level to conduct a 50'agl low level route down the Colorado River. Wires commentary dominated proceedings, although the crew also made some observations about civilians in the Colorado River. The crew were vigilant to mark wires that were not shown on the map to debrief the Squadron on their return. The passengers were again permitted to sit on the ramp for a further 4 minutes and returned to their seats prior to the next landing. Seating positions on landing are shown at Figure 6.

W 1-3, 5, 10,
12



W 1-3, 5, 10, 11, 12

Figure 6: ZA671 Seating Positions of Crew and Passengers at 1306

21. At approximately 6 miles, Acmn 2 briefed the next landing area; PB 5. The crew again elected to conduct an orbit to carry out a 5S⁶ recce as they were not familiar with the landing site. Acmn 2 then gave a landing brief, having elected to land next to what he perceived as large bush. The landing site was firmly identified by the crew using the internal navigation equipment, map and HLS Directory sheet for PB5, even though the chosen LS was actually some 368m to the East of the actual PB5. The pre-landing checks were carried out by the NHP. Passengers 2 and 3 were not told to secure themselves using their seat belts and remained seated but on the dispatcher harness throughout the landing. The HP manoeuvred the aircraft on to finals and decelerated to meet the first gate on the DL profile (100' at 30 kts). The aircraft was flown directly into wind, with the intention to finish the DL alongside their chosen "large bush" marker.

W 1-3, 5

W 10, 12

ACCIDENT SEQUENCE

22. **The Final Manoeuvre.** At 1306 the aircraft continued towards the descent point at 100'/30kts. The NHP gave speed and heights readings as required in SOP21. The HP called "starting approach" whilst within in the 100'/30kts "initial gate"⁷, and after a 2-3 second delay the aircraft started its descent. Figure 7 shows the transcript from the CVFDR for the crash.

W 1-3, 5
E 19

23. The aircraft did not meet the second 75'/25kts⁸ DL approach "gate" being 4 kts too slow because the required angle of attack of the first stage flare, applied by the HP, had been incorrectly assessed. The NHP called "75 slow", and the HP attempted to correct by applying a forward cyclic correction. The 50'/20kts gate call was missed by the NHP. The rad alt then correctly gave a warning at 40'. At this point the Rate of Descent (ROD) had increased to approximately 800ft/min. The rear wheels contacted the ground with a ROD of approximately 600ft/min.

E 19
Annex A

⁶ 5S: Slope, shape, surface, size and surroundings.

⁷ SOP 21: "Initial gate" for starting the DL approach is 100' at 30kts.

⁸ SOP 21: Subsequent "gate" is 75'/25kts +/- 2kts

Figure 7 – CVFDR Recording for PB 5 Landing.

Crew Position	CVFDR Voice Recording
NHP	"95 feet, 29 knots"
NHP	"29 knots, 95 feet"
NHP	"29 knots, 95 feet"
NHP	"29 knots, 95 feet"
NHP	"Still in the gate"
NHP	"28 knots, 95 feet"
HP	"Starting approach"
Acmn 2	"Clear forward and down"
NHP	"75, 20 slow"
RADALT	Audible warning tone
HP	"Cancelling...continuing"
NHP	"Slow"
Inaudible vocal. In interviews this was suggested as:	
Acmn 1: "Dust cloud building, ramp mid point"	
and/or	
Acmn 2: "Sand and Gravel guys"	
Acmn 2	"10, 8, 5, 2...."
Acmn 1	"Overshoot...overshoot...overshoot"

24. **Impact Sequence.** As the rear wheels impacted the surface they very quickly sank into the soft sand to a depth of 28cm, resulting in minimal / no compression of the rear undercarriage, insufficient to operate the WOW micro-switches. Sand built up in front of the wheels which effectively increasing braking effect, decelerating the aircraft at a higher rate than normal.

Annex A

25. At the point of rear wheel impact, Acmn 1 called "overshoot" and simultaneously the cyclic stick was moved forward. The combination of the cyclic forward movement (which decreases the pitch on the forward rotor and increases it on the rear) and the rapid deceleration of the aircraft resulted in the aircraft very quickly pitching nose down. This resulted in the forward undercarriage impacting the desert surface, sinking into the soft sand further slowing the aircraft, whilst the pitching motion lifted the rear undercarriage clear of the sand. The pitching moment continued to a 10 degrees nose down attitude causing the cockpit floor structure to impact the desert surface. This overloaded aircraft structure Station 120, which supports the forward transmission rear mounts causing the forward transmission to move rearwards and down into the cabin. This deformation of the cockpit and forward cabin caused the troop commanders seat to collapse as the transmission moved rearwards and down. The No1 synchronisation shaft (sync shaft) failed, followed by the No 2 sync shaft which was forced upwards and out through the No1 drive shaft tunnel cover.

Annex A

26. With the forward and aft main rotor heads now de-synchronised, the aft pylon became overloaded and failed, partially collapsing into the rear of the aircraft. The No 9 sync shaft failed as the rear pylon collapsed and the shaft entered the rear cabin area. As the aircraft came to a stop, the aircraft rotated around the pitch axis so that the rear of the aircraft dropped until the rear undercarriage made contact with the

Annex A

desert surface, and dug in. At this point one of the forward main rotor blades (MRB) impacted the sand. Images of the aircraft post impact can be found in Figures 10 – 22.

E 33-35

27. **Experience of Crew and Passengers.** Upon impact the following happened to each of the passengers / crew:

a. **HP.** As the rear wheels touched down, believing the landing to be safe, the HP lowered the collective, began to lower the nose by pushing the cyclic forward⁹ and he also thinks he began to apply the wheel brakes. As the front wheels hit, he continued to believe the landing was successful and he did not feel that the aircraft had hit the ground any harder than expected. He heard the “overshoot” call. Although believing that he went to pull power and conduct overshoot recovery actions, analysis of the CVFDR data shows that the engine torque spikes at this time are indicative of a drop in rotor speed as the sync shafts failed, rather than an input demand by the pilot. The HP felt the aircraft shake violently, was thrown around in his seat and observed half a MRB going past the window. He also lost comms with the crew. When all violent motion ceased he shut down the aircraft systems and the starboard T handle to shut off the fuel. On completion of the emergency shut down drill he removed his harness and jumped out the right hand cockpit door, which had detached on impact. He later returned to the aircraft to turn off the internal battery as the gyros were still running.

W2

Annex A

b. **NHP.** As the rear wheel touched down the NHP was not following through on the controls; his hands were resting on his legs, his feet short of the pedals. He recollects that he considered calling an overshoot but did not. He felt the aircraft rapidly decelerate, being thrown forward in his harness and then felt the aircraft wobbling violently in circles. He adopted the brace position and observed half a MRB rotate pass the cockpit. His view of the HP was blocked as the overhead console collapsed, which prompted him to shut down both the ECLs and pull the port fire T handle to shut off the fuel. He tried to communicate with the HP using the foot operated intercom but failed. He undid his harness, jettisoned the left hand cockpit door and egressed the aircraft.

W5

c. **Acmn 1.** Acmn 1 was located at the rear port side of the aircraft next to the aft bubble window and was secured by a dispatcher harness only. At around 2' from the ground he felt a “fizzing feeling” in his stomach that prompted him to make the “overshoot” call. He heard the bang of the rear wheels hitting the ground, heard the engines spool up and then the aircraft impacted the ground again. At this point he was thrown vertically into the air, but not further forward into the cabin. His eye-line moved from the centre of the window to the top of the frame and back. He heard a significant amount of noise. Looking backwards, he noticed the rear gearbox had collapsed and the ramp was obscured. He then noticed the No.9 sync shaft spinning very rapidly in the air whilst moving down the cabin towards the passengers. He got off his seat and kicked it hard back up the ramp with his right foot. He then undid his dispatcher harness. He shouted “get out” and assisted the passengers with removing their harnesses. He identified 2 windows on the starboard side and pulled out the frames, removing the windows. He helped the passengers out the windows, walked up to the bob tank, observed Acmn 2 assisting Passenger 1, confirmed with Acmn 2 that all the passengers had exited the aircraft and then exited via a

W1

⁹ The correct technique is to maintain aft cyclic and allow the nose to drop onto the nose wheels slowly and under control.

window. His right foot got stuck but he was able to release it.

d. **Acmn 2.** Located at the forward starboard door of the aircraft, Acmn 2 was secured by a dispatcher harness only. He called “on” as the rear wheels touched and simultaneously heard Acmn 1 call “overshoot”. He felt the rear wheels impact the ground first, then the front wheels. At this point the upper door hatch detached from the aircraft structure, hitting him on the head and shoulder, knocking him backwards onto the cabin floor. As the aircraft came to a sudden stop he was then thrown forward into the heater compartment. He struggled to his feet, heard the MRBs smashing against each other, felt the cabin violently rocking and saw the forward gearbox screw downwards in slow motion. He went to grab Passenger 1 from the jump seat which collapsed and he was able to drag him away. Some hydraulic fluid then fell on his arms and gloves. His intercom was still functioning and he called to the other crew members but got no reply. He headed with Passenger 1 towards the ramp and Acmn 1; noticing it was blocked he helped Passenger 1 out of the window previously released by Acmn 1. He then released another window on the starboard side and exited. (S40)

W3

e. **Passenger 1.** Passenger 1 was seated in the jump seat and although he was connected to the intercom could not hear the front seat crew communicating. He felt the rear wheels touch down, followed by the front wheels and then he perceived the aircraft taking off again. Sensing the landing was not quite right, he then saw the ground coming towards him and then the nose of the aircraft ploughing through the sand, “like a boat through water”. This was followed for a few moments by loud noise. The structure above his head collapsed falling at a 45° angle, and he moved to avoid being struck. He was covered with hydraulic fluid which prompted him to unbuckle his seatbelt. The jump-seat collapsed as he was assisted up by Acmn 2, who escorted him to the rear of the aircraft. As the ramp was obscured he exited through a starboard window. (S40)

W11

f. **Passenger 2.** Passenger 2 was seated in the rear of the aircraft on the starboard side, adjacent to the back window and was sitting angled forward, and was secured by a dispatcher harness only. Originally he was leaning his head out of the window with his elbow on the window frame but turned back inside the aircraft due to the dust a few seconds prior to impact and turned to face Passenger 3. As the rear wheels impacted the ground he was lifted out of his seat, and remembers hearing the “overshoot” call. He looked up the cabin, noticed Acmn 2 disappear as he fell, and a lot of sand. He clung to the webbing behind the seats to avoid being thrown further forward. He then noticed the No 9 sync shaft rotating towards him like a spinning top which reached approximately 6 inches from his legs. It was then kicked away by Acmn 1. He then looked rearwards and noticed the ramp was obscured. On hearing calls to “get out” he stood up and due to shock tried to detach his harness from the ceiling rather than his waist. He was aided by Acmn 1. He jumped head first out of the window that had been released by Acmn 1 and ran from the aircraft.

W10

g. **Passenger 3.** Passenger 3 was seated in the rear of the aircraft on the port side, forward of Acmn 1, and was secured by a dispatcher harness only. He was sitting facing inwards and kept his head down due to the dust. He recalls hearing Acmn 1 call “overshoot” and the rear wheels impacting the ground. He was thrown into the air and landed on the passenger seats, feet

W12

towards the nose of the aircraft. He heard a grinding sound and perceived that the aircraft was sliding along the ground. On hearing the words “get out”, he rose and unbuckled his dispatcher harness. He exited the aircraft head first through a starboard window released by Acmn 1.

28. **Immediate Aftermath of Accident.** The crew and passengers mustered approximately 30-50m from the aircraft. Acmn 1 took charge of the crew and passengers. After ensuring that no one was seriously injured and there was no risk of fire, the crew returned to the aircraft to retrieve their ‘Go Bags’ and the HP also switched off the internal battery. First aid was given by Acmn 2 to Passenger 1. Whilst Acmn 1 and the NP/NHP attempted to communicate with NAFEC, the passengers were tasked with erecting a shelter and distributing sun-protective clothing and suntan lotion. Acmn 1 made contact with the 27C Flt Comd approximately 15 minutes later using the satellite (SAT) phone as there was no mobile phone signal.

W 1-3, 5, 10,
11, 12

E20

POST CRASH MANAGEMENT (PCM)

29. **Rescue and Evacuation.** The crew were rescued and crash site secured in the sequence shown at Figure 8. All times are approximate and local (GMT-8, US West Coast).

W 1-3, 5, 8,
10-12, 14-16,
20

30. **Accident Notification.** 27C Flt Comd coordinated activity within 27C Flt Ops Room. Sqn activity included initial contact with the emergency services, contacting Duty Personnel and the Chain of Command in the UK, establishing a guard force and liaising with NAFEC for assistance. To note, although Acmn 1 had correctly briefed that the aircraft had been in a catastrophic accident, this was reported to 27 Sqn, 669 Sqn, JHF(US) CO and the UK as a “heavy landing” by 27C Flt Comd. It took several hours before the full severity of the accident was understood by all involved with the rescue. Reports within the UK continued to make reference to a heavy landing, including Joint Helicopter Command, the Officer Commanding RAF Odiham, the MilAAIB and the SI Panel for a number of days.

W 1, 8, 15

E25

W 21, 26

31. **PCMIO Activity.** 669 Sqn Ops Room coordinated the efforts to rescue the crew and passengers using the Lynx and establish PCM activity at the crash site. It must be noted that the efforts of 669 Sqn and particularly the PCMIO are to be highly commended. Both the Panel and the MilAAIB were impressed with the way the crash site and the evidence had been preserved.

W 14, 16

32. **Media.** Contact with local media was coordinated via JHF(US) CO and NAFEC Public Relations Officer (PRO). An initial press statement was issued and no further comments made by the deployed staff. Requests for further information were refused and interest died quickly.

W15
E140

33. **NAFEC Support.** NAFEC provided a good level of support including the provision of a caravan and, vitally, an armed guard for the aircraft and the Guard Force until the aircraft was finally removed by JARTS.

W15, 20

Figure 8: PCM Sequence to Recover the Crew and Passengers of ZA671

Time (approx/ local)	Occurrence (7 Apr 12)
1307	ZA671 impacts the ground at 32° 51.46N /114 27.46 W.
1323	Acmn 1 contacts 27C Flt Comd using satellite phone. Flt Comd initiated PCM activity, and requests assistance from 669 Sqn AAC.

E 20-24, 28-
32