

PART 1.3 – NARRATIVE OF EVENTS

All times local (Zulu plus 1 hour).

Synopsis

1.3.1 On 5 Jul 11, Puma HC Mk1 XW211 was due to fly a MAUM sortie departing at 0900; this sortie was delayed due to a change of crew. The amended crew were detailed to carry out a similar flight profile, having reverted to standard ac mass. The crew now consisted of 2 LCR pilots and a CR crewman. The sortie comprised basic navigation and GH.

Exhibit 4
Witnesses 9 & 12

1.3.2 The sortie was briefed in the presence of a 33 Sqn QHI; it was authorised by the 33 Sqn DA post an out-brief. XW211, callsign VORTEX 344 departed RAF Benson at low level to SPTA where GH exercises were conducted, followed by an approach to MW; all without incident.

Exhibits 5, 6, 9 & 10
Witness 9

1.3.3 XW211 landed at MW airfield for a planned refuel and a change of handling pilot/capt. During ac external checks, a discrepancy in the expected hydraulic fluid levels was found and in order to conduct fault diagnosis, the crew opened the MRGB cowling. Following telephone consultation with Puma Force engineering personnel, the ac departed MW to return to RAF Benson. Three minutes after take-off, the MRGB cowling departed the ac and impacted the MRBs and TRBs. The crew of XW211 carried out an emergency landing in a field to the SSE of Andover, resulting in Cat 5 damage (see Figure 1).

Witness Crew
Part 1



Figure 1 – XW211

1.3.4 All crew members evacuated the ac without assistance. Hampshire Fire and Police services were first on-scene following telephone calls from the public. The aircrew received medical attention before being transferred to Basingstoke and North Hampshire Hospital.

Exhibit 19

1.3.5 Ac debris was found at 2 sites as shown at Figure 2: the main crash site (Accident Site One); and an area 1.2 km to the SW of the main crash site (Accident Site 2) where parts from the MRGB cowling and MRBs were found.

Exhibit T1 & T2



Figure 2 – XW211 Accident Sites

Pre-Accident Events

Crew Composition

1.3.6 **HP.** The HP was LCR on his 1st tour on the Puma who had completed the Puma OCF in Feb 11. He had flown a total of 406.20 hrs as a pilot, including 159.20 hrs on the Puma of which 2:40 hrs were as ac capt. Prior to the Puma OCF, the HP had completed the pilot's course at DHFS to an average standard. The HP had previously served as an AEOp for 5 years on the Nimrod MR2 and had been assessed as high average.

Exhibit 1

1.3.7 **NHP.** The NHP was an LCR pilot with a total of 2290:40 hrs, including 133:45 hrs on the Puma of which 9:15 hrs were as Puma ac capt. During his first 2 flying tours, he had flown Sea Kings on the RAF SARF. He also completed the Puma OCF in Feb 11 and had been assessed as average.

Exhibit 2

1.3.8 **CM.** The CM was CR with a total of 587:55 hrs, of which 488:30 hrs was on the Puma.

Exhibit 3

Previous 24 hours

1.3.9 The HP, who was ac capt at the time of the accident, reported to work at midday on Mon 4 Jul. After attending a Sqn photo-call, he noted that he and another LCR pilot were flying a CR work-up training sortie with the QHI at 0900 on the following day. He was unable to prepare further for this sortie as these crew members were deployed separately, supporting Army exercises. The HP attended the local Air Cadet unit on Monday evening during which he received a phone call from the NHP giving the basic outline of the sortie. He returned home at approximately 2145, before proceeding to bed at 2300. Having woken at 0600, the HP had breakfast before arriving at work at approximately 0730.

Witness 3

1.3.10 The NHP and CM had detached to Otterburn Training Area, from 30 Jun – 4 Jul, in support of an Army exercise. During this period they had operated as part of a ‘constituted’ crew. With the exception of 1 Jul, support to the exercise had involved both day and night flying. On 3 Jul, they had taken-off at 1000 and landed for the final time at 2350, having flown 3:15 hrs day and 1:15 hrs night. On 4 Jul, they took off at 1040 and returned to RAF Benson, landing at 2050 having flown for 4:45 hrs. On landing, it was noted that they were due to take-off at 0900 on the following day and they agreed to meet at 0730 to prepare for the sortie.

Exhibit 12
Witness 1

1.3.11 The NHP, on returning home, contacted the QHI to clarify the sortie content and then passed this information on to the HP. He spoke to the Sqn Ops between 2230 and 2300 to make the bookings for low-level, relevant training areas and airfields. The NHP then retired at 2300 and awoke in time to have breakfast before joining the HP at work by 0730 the next day.

Witness 1

1.3.12 The CM went to bed at approximately 2245 and arose at 0650. He elected not to have breakfast (as usual) and was at work for 0730 where he assisted the pilots with preparing for the sortie.

Witness 2

Sortie Details and Preparation

1.3.13 On arrival at the Sqn, the sortie profile was confirmed by the crew (pending any amendment by the QHI). The planned sortie was a pre-CR training flight with the ac at MAUM, which comprised 2 flights with the QHI as the ac capt throughout and occupying the left-hand seat. For the first flight, the NHP (at the time of accident) would fly as handling pilot in the right-hand seat for a low-level flight to SPTA. Subsequently, the ac was to recover to MW for refuelling and a change of handling pilot. When not acting as handling pilot, the additional pilot was to be a passenger in the rear cabin.

Exhibit 13
Witnesses 1, 2,
3 & 12

1.3.14 Prior to the sortie brief (known colloquially as the SOP 18 brief), the crew of XW211 were made aware that there was a separate sortie requirement for an air-test capt and that the QHI was the only one available; thus the QHI might not be available for the intended training flight. At 0800, the crew and QHI attended a pre-sortie briefing on the assumption that the DA would be able to find another pilot to fly the air-test. Post this brief, the QHI was informed that he would be required for the air-test. Keen not to lose the training opportunity, the QHI amended the sortie such that the profile remained the same but it would no longer be flown at MAUM and without the QHI. An ac capt was nominated from the 2 LCR pilots to act as handling pilot for the flight to MW. Upon arrival at MW, the role of ac capt was to be handed over to the second pilot, who would fly as

Exhibit 24
Witnesses 3, 9 &
12

handling pilot for the return.

1.3.15 The sortie was re-planned to be flown as follows:

- a. Low level flight to SPTA followed by GH.
- b. An instrument approach into MW for a refuel and handover of ac capt/handling pilot.
- c. A repeat of Para 1.3.15a, with the new capt repeating the exercises as handling pilot before returning to RAF Benson.

Exhibits 6, 9 & 10

Exhibit 5

Exhibit 5

1.3.16 The re-rolling of the ac resulted in a delay to the take-off of 38 minutes. During this time, amendments to bookings and briefings were carried out.

Exhibits 6 & 20

Sortie Execution

1.3.17 XW211 departed RAF Benson at 0938 and arrived MW at 1138, whereupon the ac was refuelled. The change of ac capt was recorded on the MF705 (Puma), which was removed and taken to MW Tower for posting back to RAF Benson. As the oncoming capt, the HP commenced his external checks (as shown in green at Figure 3), which he curtailed when he found a discrepancy in the expected fluid levels between No 1 and No 2 hydraulic systems. The No 2 system indicated that the reservoir was filled to a level above the maximum limit (sight glass full), whilst the No 1 system indicated a fluid level within limits. This was reported by the HP to the DA via telephone.

Exhibits 18 & 20
Witness 3

1.3.18 As part of the crew's fault diagnosis, the MRGB cowling was unlocked and moved backwards so that the internal sight glasses on both hydraulic reservoirs could be inspected. In parallel, the HP spoke by telephone to the DA, EPM and Rects Controller at RAF Benson to seek engineering advice; he was advised to wait for further guidance. Following this, the crew discussed the need for an entry in the MF700C to reflect the movement and subsequent closure of the MRGB cowling.

Exhibits 21
Witnesses 1, 2,
3, 5, 13 & Crew
Part 2

1.3.19 Following advice from engineering personnel, the crew checked the level of the hydraulic fluid using the inboard sight-glasses and then exhausted the No1 hydraulic system pressure; this resulted in the No 1 hydraulic system fluid level returning to the expected level.

Witness 5
(including hot
statement)

1.3.20 As the No 2 hydraulic system fluid level remained above the maximum level (the sight glass was full), engineers were placed on standby to deploy to MW to further investigate the fault.

Witness 5

1.3.21 Pending arrival of the engineers, the crew elected to take lunch at MW. Due to light rainfall, the CM decided to move the MRGB cowling forward until it was almost closed. Post lunch, the crew received a further phone call from the DA who advised that the engineers had not yet departed RAF Benson and suggested, following advice from the QHI, that if the hydraulic level had dropped over lunch, a HTGR and operation of the AP hydraulic system should be completed. If the levels reduced to normal, the ac could return to RAF Benson.

Witnesses 1, 2,
3, 9, 12 & Crew
Part 1

1.3.22 The HP completed a partial external check of the ac moving anti-clockwise from the No 2 hydraulic reservoir to the No 1 hydraulic reservoir (shown in blue at Figure 3). At this point, he entered the Puma in preparation for the HTGR whilst the CM closed the MRGB cowling, watched by the NHP. The NHP then checked the security of the MRGB cowling.

Witnesses 1, 2, 3 & Crew Part 2

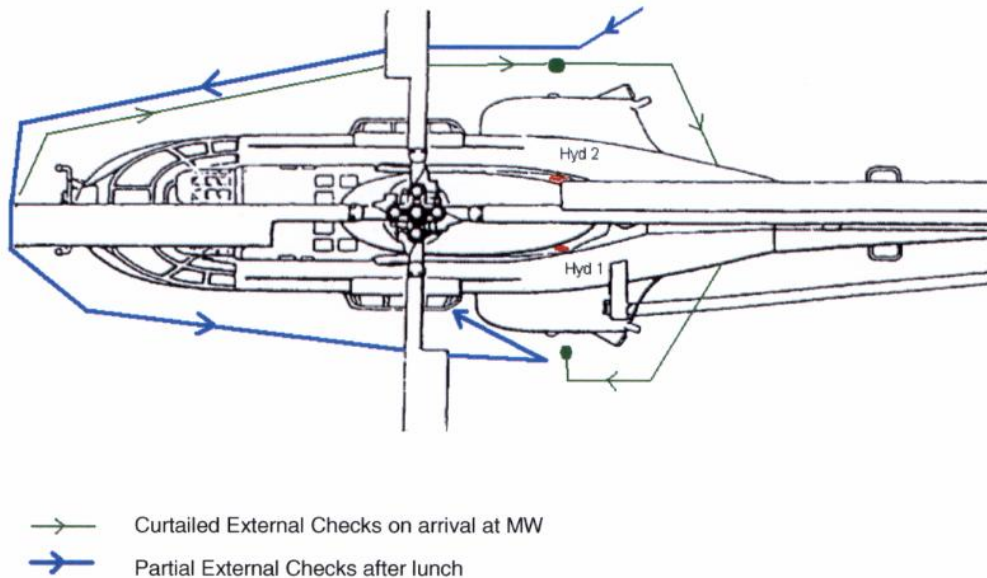


Figure 3 - Schematic of External Check Walk-Rounds at MW

1.3.23 The CM observed the hydraulic levels during the HTGR; the No 1 hydraulic system level was normal but the No 2 remained above the maximum level, albeit at a slightly lower level than that witnessed previously. The HP elected to shut down the ac and all 3 crew observed the No 2 hydraulic level before the HP phoned the DA to advise him that the No 2 hydraulic level had dropped but was still above maximum. Following a brief wait, during which the DA consulted engineering management, the DA authorised the crew to fly the ac directly back to RAF Benson at 1000 feet.

Witnesses 2, 3, 9 & Crew Part 1

1.3.24 After a brief crew discussion, a normal start was completed under the clearance of an AACen Marshaller and the ac departed MW at 1320.

Witnesses 3 & 23

Accident Events

1.3.25 The ac levelled at 1000 ft RPS (900 ft AGL) and as it accelerated to approximately 135 kts, the MRGB cowling detached and impacted the MRBs and TRBs at 13:23:31. The crew heard a loud 'bang' and the ac developed a severe, largely vertical, vibration (the instruments could not be read). A single low NR tone was triggered, as well as AVAD Master Cautions that continued throughout the emergency. The HP initiated an immediate and rapid descent towards a chosen field 1.2 km in the ac's one o'clock. The HP called for 'Gear Down', which was selected by the CM who then moved from the centre seat into the cabin, removed his dispatcher's harness and sat in the seat immediately forward of the stbd cabin door. The NHP initiated a Mayday call (which was repeated during the descent) 6 secs after cowling separation. Despite some un-demanded rolling, yawing and pitching motion, ac speed was maintained until approximately 500 ft AGL. The CM declared himself secure in the cabin and confirmed gear down 17 secs after

Exhibits 15, 18 & 25
 Witness Crew Parts 1 & 2

cowling separation. At approximately 300 ft AGL the ac yawed 90⁰ to the left. Unable to maintain heading, flight towards the field was achieved by use of right cyclic. As the ac passed through 150 – 200 ft AGL, the CM called 'Brace, Brace' and he alone adopted the brace position. The ac continued to yaw to the left such that the final stages of the approach were achieved by rearwards flight. At approximately 100 ft AGL and overhead the field, the ac pitched nose down and rearwards motion ceased. A vertical high RoD persisted, despite the HP and the NHP applying collective in the last moments of flight. Two seconds before impact the HP called 3 times for 'Throttles' but the ac impacted the ground on its port undercarriage before the NHP closed the fuel shut off levers. Subsequently, he attempted to close the throttles. The ac crashed 7 km SSE of Andover 33 secs after MRGB cowling separation. The impact with the ground caused substantial damage to the tail and main fuselage. Following impact the ac yawed approximately a further 90⁰ whilst rolling onto its stbd side. The MRH turned under power until the engines were starved of fuel. During this period, a high NR high tone was heard for 8 secs. Eight seconds after impact, an engine fire warning was also activated by the AVAD.

Post Accident Events

Escape and Survival

1.3.26 Once all motion had stopped, the CM released himself from the lap-belt restraint harness and climbed out of his seat. On noting a small amount of smoke coming from the port engine, he collected the cabin fire extinguisher before checking on the front crew. The CM then opened fully the port cabin door and climbed out. The smoke had cleared by the time he had left the cabin. He moved away from the ac and activated his SARBE 7 PLB.

Witness 2
Annexes A & B

1.3.27 After turning off the electrics (post engine shutdown drills), the HP and NHP climbed out of their seats and passed through the companion way into the rear cabin whereupon they exited by climbing through the port cabin door. They proceeded to jump down from the side of the ac and rendezvoused with the CM at the ac's 12 o'clock position, whereupon the NHP lay down to (S40)

Exhibit 27
Witnesses 1 & 3
Annexes A & B

PIDAT

1.3.28 The Stn Cdr RAF Benson elected not to carry out PIDAT.

Exhibit 22

Rescue

1.3.29 Within approximately 10 mins, the emergency services started to arrive at Accident Site One; initial response being from the Police, closely followed by Hampshire FRS and Ambulance Services. The crew were treated by paramedics. Although the air ambulance had arrived, the crew elected to travel by road ambulance to hospital.

Exhibit 19
Annex A

PCM

1.3.30 As first to arrive at Accident Site One, PCM was initiated by Hampshire Police who assumed incident command and set an initial cordon. Command and control of the rescue operation was assumed by Hampshire FRS before handover to the DFS (from MW). The Duty PCMIO from RAF Odiham, the RRU, was

Exhibits 19 & 23
Annex C & D

contacted at 1358. DFS maintained the cordon and once the PCM team were in place, they handed over responsibility to PCMIO. RAF Odiham, RAF Benson and MW jointly provided a guard force.

1.3.31 Media presence was limited and information release controlled by the PCMIO.

Annex D

1.3.32 AACen MW and RAF Benson impounded their fuel bowsers and relevant documentation.

Exhibits 15
Annex E

Salvage Operations

1.3.33 MAAIB Ops and Eng Investigators arrived at Accident Site One around 1525 and was followed by the JARTS at 1630.

Exhibit 19 & T2

1.3.34 XW211 was recovered by road to MW on 7 Jul by JARTS under the direction of the MAAIB LAI.

1.3.35 Remediation of the Accident Site One was completed on 8 Jul but closed on 20 Jul post removal of contaminated waste.

1.3.36 The initial search of Accident Site 2 was completed on 9 Jul. As parts of the ac were still missing, follow-up surveys by ESG were completed between 3 and 11 Aug. The final search occurred on 16 Aug; this completed the remediation of Accident Site 2.