PART 1.1 – COVERING NOTE

4 Nov 14

DG MAA

SERVICE INQUIRY INVESTIGATION INTO INCIDENT INVOLVING QINETIQ GAZELLE HT3 XZ936 AT MOD BOSCOMBE DOWN ON 2 JUN 14

1. The Service Inquiry Panel assembled at MilAAIB Farnborough on 10 Jun 14 by order of the DG MAA for the purpose of investigating the incident involving QinetiQ Gazelle XZ936 on 2 Jun 14 and to make recommendations in order to prevent recurrence. The Panel has concluded its inquiries and submits the provisional report for the Convening Authority's consideration.

PRESIDENT

[redacted]
Major
President
XZ936 SI

MEMBERS

[redacted]
Flt Lt
Engineering Member
XZ936 SI

[redacted]
Lt (RN)
Aircrew Member
XZ936 SI

2. The following inquiry papers are enclosed:

Part 1 (The Report)
Part 1.1 Covering Note
Part 1.2 Convening Orders & TORs
Part 1.3 Narrative of Events
Part 1.4 Findings
Part 1.5 Recommendations
Part 1.6 Convening Authority Comments

Part 2 (The Record of Proceedings)
Part 2.1 Diary of Events
Part 2.2 List of Witnesses
Part 2.3 Witnesses Statements
Part 2.4 List of Attendees
Part 2.5 List of Exhibits
Part 2.6 Exhibits
Part 2.7 List of Annexes
Part 2.8 Annexes
Part 2.9 Schedule of Matters Not Germane to the Inquiry
Part 2.10 Master Schedule

MAA SI Convening Order

9 June 14

SI President
SI Members
Hd MilAAIB

Comdt AACen
MAA-Legad 1
[redacted] – QinetiQ Observer

Copy to:
PSO/CAS
DCom Ops
CofM (Air)
AOC 2 Gp

Comdt AWC
CTP Boscombe Down
Gary Borland – MD Air (QinetiQ)

MAA DG/SI/01/14 – CONVENING ORDER FOR SERVICE INQUIRY INTO AIRCRAFT OCCURRENCE INVOLVING GAZELLE XZ936 ON 2 JUNE 14 AT 1057Z

1. A Service Inquiry (SI) is to be held under Section 343 of Armed Forces Act 2006 and in accordance with JSP 832 – Guide To Service Inquiries (Issue 1.0 Oct 08).

2. The purpose of this SI is to investigate the circumstances surrounding the subject aviation occurrence and to make recommendations in order to prevent recurrence.

3. The SI Panel is to assemble at the MilAAIB Farnborough on 10 June 14 at 1200Z to receive an initial briefing into the occurrence. Formal convening of the Service Inquiry will take place at 1500Z.

4. The SI Panel comprises:

President:	[redacted]	**AAC**
Members:	**Air Member:** [redacted]	**RN**
	Eng Member: [redacted]	**RAF**

5. The legal advisor to the SI is [redacted] **(MAA-Legad1)** and technical investigation/assistance is to be provided by the Military Air Accident Investigation Branch (MilAAIB).

6. The SI is to investigate and report on the facts relating to the matters specified in its Terms of Reference (TOR) and otherwise to comply with those TOR (at Annex). It is to record all evidence and express opinions as directed in the TOR.

7. Attendance at the SI by advisors/observers is limited to the following:

Hd MilAAIB / DepHd MillAAIB– Unrestricted Attendance.

MilAAIB investigators in their capacity as advisors to the SI Panel – Unrestricted Attendance[1].

[1] On a case by case basis as authorised by Hd MilAAIB.

[redacted], RAFCAM HF Accident Investigator – Unrestricted Attendance.
[redacted], RAFCAM HF Accident Investigator – Unrestricted Attendance.

[redacted] QINETIQ Rep – Observer Status. Attendance at SI Panel deliberations to be determined by SI President.

8. The Panel will initially work from facilities at Farnborough, Middle Wallop Airfield is requested to provide DII equipped facilities for use by the panel as required.

9. Reasonable costs will be borne by DG MAA under UIN D0456A.

Original Signed

R F Garwood
AM
DG MAA – Convening Authority

Annex:

A. Terms of Reference for SI into Aviation Occurrence Involving Gazelle XZ936 on 2 June 14 at Boscombe Down.

ANNEX A TO
Gazelle Convening Order
DATED 9 June 14

TERMS OF REFERENCE FOR SI INTO AVIATION OCCURRENCE INVOLVING GAZELLE XZ936 ON 2 JUNE 14 AT 1057Z AT BOSCOMBE DOWN.

1. As the nominated Inquiry Panel for the subject SI, you are to:

   a. *Investigate and, if possible, determine the cause of the occurrence, together with any contributory, aggravating and other factors and observations.*

   b. *Ascertain whether Service personnel involved were acting in the course of their duties.*

   c. *Ascertain whether civilian personnel involved were acting in the course of their duties.*

   d. *Examine what policies, orders and instructions were applicable and whether they were complied with.*

   e. *Determine the state of serviceability of the aircraft and relevant equipment.*

   f. *Establish the level of training, relevant competencies, qualifications and currency of the individuals involved in the accident.*

   g. *Review the levels of authority and supervision covering the task during which the incident occurred.*

   h. *Identify if the levels of planning and preparation were commensurate with the activities' objectives.*

   i. *Investigate and comment on relevant fatigue implications of individuals' activities prior to the matter under investigation.*

   j. *Ascertain if aircrew escape and survival facilities and equipment assemblies were fully utilized and functioned correctly.*

   k. *If appropriate, investigate the level of any injury sustained and whether such injury will be the exciting cause of later disability, as established from expert testimony.*

   l. *Determine any relevant equipment deficiencies.*

   m. *Confirm that the Aircraft Post-occurrence Management procedures were carried out correctly and that they were adequate.*

   n. *Ascertain whether the appropriate consideration of EOL training risks had been taken by the DH when making his Safety Statement.*

   o. *Determine and comment on any broader organizational and/or resource factors.*

   p. *Assess whether the security of personnel, equipment or information was compromised and if so to what degree.*

   q. *Ascertain value of loss/damage to the Service and/or extent (and, if readily available, the value) of loss/damage to civilian property.*

r. Assess any Health and Safety at Work and Environmental Protection implications in line with JSP 375 and JSP 418.

s. Report and make appropriate recommendations to DG MAA.

t. Produce an Aircraft occurrence Summary, to be completed within 2 wks of DG MAA signing off the SI.

2. You are to ensure that any material provided to the Inquiry by the United States, or any other foreign state, is properly identified as such, and is marked and handled in accordance with MOD security guidance. This material continues to belong to those nations throughout the SI process. Before the SI report is released to a third party, authorization should be sought from the relevant authorities in those nations to release, whether in full or redacted form, any of their material included in the SI report, or amongst the documents supporting it[1] You are not to make a judgement on the origin of any classified material[2]. In addition, the relevant PDR directorate should be informed early when dealing with the US or other foreign state material, and should be engaged in the process where doubt exists.

3. During the course of your investigations, should you identify a potential conflict of interest between the CA and the Inquiry, you are to pause work and take advice from your MAA Legal Advisor, Hd MilAAIB and DG MAA. Following that advice it may be necessary to reconvene reporting directly to MOD PUS.

[1] For intellectual intelligence material this should be done through DIS (DICSD-SEC).

[2] If you are unable to positively identify the origin of the material, you must contact INFO-ACCESS DPAD or, for intelligence material, DIS (DI CSD-SEC).

PART 1.2 - GLOSSARY

Acronym/ Abbreviation	Explanation
AAC	Army Air Corps
AC	Alternating Current
ACLP	Armour Capable Life Preserver
ACM	Aircrew Manual
ADF	Acceptable Deferred Fault
ADR	Accident Data Recorder
AEA	Aircrew Equipment Assemblies
agl	above ground level
AH	Army Helicopter
ALARP	As Low As Reasonably Practicable
AOA	Aircraft Operating Authority
AoR	Area of Responsibility
AP	Air Publication
ARF	Airborne Reconnaissance Force
ARM	Aircraft Repair Manual
ARO	Aircraft Recovery Officer
ASIMS	Air Safety Information Management System
ASMP	Air Safety Management Plan
ASC	Air Safety Cell
ASO	Air Staff Orders
ATC	Air Traffic Control
ATRM	Aviation Task Risk Matrix
AWC	Air Warfare Centre
AWC ASOs	Air Warfare Centre Air Staff Orders
CA	Constant Attitude
CADS	Centralised Aviation Data Service
CAMO	Continuing Airworthiness Management Organisation
CAT	Category
Cdr	Commander
CF	Contributory Factor
CFS(H)	Central Flying School (Helicopter)
CO	Commanding Officer
CoC	Chain of Command
CRM	Crew Resource Management
CT	Continuation Training
CTP	Chief Test Pilot
CVR	Cockpit Voice Recorder
CWP	Central Warning Panel
DCDSDO	Deputy Chief of Defence Staff Duty Officer
DDH	Delivery Duty Holder
DE&S	Defence Equipment and Support
DASOR	Defence Air Safety Occurrence Report
DG	Director General
DH	Duty Holder
DHFS	Defence Helicopter Flying School
EASA	European Aviation Safety Agency
EOL	Engine Off Landing
ETPS	Empire Test Pilots' School
F	Form
Flt	Flight
Flt Cdr	Flight Commander

FOB	Flying Order Book
FOD	Foreign Object Debris
FRC	Flight Reference Cards
FSC	Flight Servicing Certificate
ft	Feet
FTI	Flight Test Instrumentation
GH	General Handling
HASEL	Height, Area, Security, Engine, Lookout (a flying check)
HF	Human Factors
HP	Handling Pilot
HPS	High Pitch Stop
Hrs	Hours
HT	Helicopter Training
Hz	Hertz
IAS	Indicated Air Speed
INM	Institute of Naval Medicine
IPS	Intermediate Pitch Stop
JARTS	Joint Aircraft Recovery & Transportation Squadron
JHC	Joint Helicopter Command
Kg	Kilogram
kts	Knots
LHS	Left Hand Seat
LIM	Limitation
LL	Low Level
LLVF	Low Level Variable Flare
LPS	Low Pitch Stop
MAA	Military Aviation Authority
MilAAIB	Military Air Accident Investigation Branch
MAUM	Maximum All Up Mass
Met	Meteorology
Mk	Mark
MMAP	Manual of Maintenance and Airworthiness Processes
MMMF	Man Made Mineral Fibres
MoD	Ministry of Defence
MPS	Maximum Pitch Stop
MRB	Main Rotor Blade
MRGB	Main Rotor Gear Box
MRH	Main Rotor Head
MRP	Military Regulatory Publications
MSC	Minimum Separation Criteria
MSD	Minimum Separation Distance
NAS	Naval Air Squadron
NDT	Non-Destructive Testing
NHP	Non-Handling Pilot
Nr	Rotor Speed (Nominal rotor)
OC	Officer Commanding
P	Pilot
PCH	Pitch Change Horn
PCM	Post Crash Management
PCMIO	Post Crash Management Incident Officer
PCR	Pitch Change Rod
PFL	Practice Forced Landing
PT	Project Team
PTT	Press To Transmit
QA	Quality Assurance

QHI	Qualified Helicopter Instructor
QQ	QinetiQ
RA	Regulatory Article
Radalt	RADAR Altimeter
RAF	Royal Air Force
RAFCAM	Royal Air Force Centre of Aviation Medicine
RHS	Right Hand Seat
RoD	Rate of Descent
RtL	Risk to Life
RTS	Release to Service
Rwy	Runway
SARBE	Search and Rescue Beacon Equipment
SAS	Stability Augmentation System
SES	Safety Equipment Section
SHE	Safety, Health and Environment
SI	Service Inquiry
SQEP	Suitably Qualified and Experienced Personnel
Sqn	Squadron
Sqn Ldr	Squadron Leader
STANEVAL	Standards and Evaluation
STARS	Squadron Training Achievement Recording System
T&E	Test and Evaluation
ToR	Terms of Reference
TP	Test Pilot
TPI	Test Pilot Instructor
TSP	Transmission Support Platform
VF	Variable Flare

PART 1.3 – NARRATIVE OF EVENTS

All times local.

Synopsis

1.3.1 At 1157hrs on 2 Jun 14, Gazelle HT3 XZ936 (TESTER 73) with an Empire Test Pilots' School (ETPS) crew of two was involved in an incident while carrying out Engine Off Landings (EOLs)[1] at Boscombe Down Airfield, Runway (Rwy) 23 Grass (Fig1). During the sortie a number of autorotations and Variable Flare (VF) EOLs were carried out without incident but on the last EOL the aircraft landed on the rear of the skids and rocked back and forward simultaneously with significant control deflections. Shortly after landing, the rear of the tail boom assembly detached due to impact from the Main Rotor Blades (MRBs). Neither crew member was injured.

Exhibit 12

Witness 3
Annex C
Annex A
Exhibit 16

Fig 1: XZ936 on Rwy 23 Grass – Boscombe Down

Pre-incident events

Aircraft history

1.3.2 XZ936 was manufactured by Westland Helicopter Limited under contract 76-71-076 and delivered to Boscombe Down in May 1978. The aircraft was built to Modification Standard No Gazelle 3/Y/1 dated Sep 1975. The Gazelle helicopter is a standard production aircraft locally modified with instrumentation and Accident Data Recorder (ADR) for use by ETPS for test pilot training. It remained on the military register and was flown under military regulations.

1.3.3 XZ936 had flown a total of 9398:25hrs, prior to the incident sortie, and had completed its depth maintenance (B4 - 400 hr frequency) in Oct 13 at 9268:35hrs. As an ETPS training asset the aircraft was fitted with Flight Test

Exhibit 19

[1] Engine set at Ground Idle. Engine not driving the rotor blades.

Instrumentation (FTI) equipment.

Crew composition

1.3.4 **The Left Hand Seat (LHS).** [redacted] Exhibit 3 Exhibit 1

1.3.5 **The Right Hand Seat (RHS).** [redacted] Exhibit 3

[redacted] was acting as the Aircraft Commander and Instructor. Exhibit 11

1.3.6 Both crew were acting in the course of their duties.

Previous 24 hours

1.3.7 The crew were well rested post the weekend break. They reported no abnormal activities and assessed themselves as fit to fly. The crew had been notified of the days flying programme, by email, prior to the weekend and were aware of the requirements for the sorties that they were to fly that day. Witness 1 Witness 2

Sortie details and preparation

1.3.8 On the day of the incident, the crew arrived at Boscombe Down for the 0900hrs Met brief. An EOL Continuation Training (CT) sortie was planned to include VF, Low Level VF (LLVF) and CA EOLs in order to regain currency for the LHS pilot and maintain currency for the RHS pilot prior to the formal work-up for delivery of the ETPS EOL syllabus sorties the following week. The LHS pilot (Handling Pilot for the incident) occupied the left seat for the sortie as this would be the seat that he would occupy when instructing students. The RHS pilot was the QHI for the sortie, as required to comply with Air Warfare Centre Air Staff Orders (AWC ASOs). Witness 1 Witness 2 Exhibit 4 Exhibit 7

1.3.9 The ETPS flying programme for the day included time set aside for aircrew to read the new AWC ASOs that were released that day. This was also the effective date for a re-write of the Military Aviation Authority (MAA) Regulatory Publications MRP Fly 2000 series of Regulatory Articles (RAs). Both crew read AWC ASOs before their flight with particular focus on the orders pertinent to their upcoming sorties. Exhibit 4 Exhibit 5 Witness 1 Witness 2

1.3.10 The sortie brief took approximately 10 minutes including specific discussion regarding the 'light' actual and forecast winds at Boscombe Down. The AWC ASO requirement is for the Gazelle to have at least 10kts of relative wind across the rotor disc during EOL training, which must include a minimum 5kts headwind component. The crew confirmed that the RHS pilot would not introduce any student type errors for the LHS pilot to correct due to the reduced margin for error as a result of the forecast winds. Exhibit 6 Exhibit 7 Witness 1 Witness 2

1.3.11 The Duty Authorizer was unavailable so authorization was provided by another qualified senior authorizer. The crew completed the ETPS Aviation Task Risk Matrix (ATRM) and the sortie was graded as an overall Mission Risk LOW (assessment headings include work pattern, mission, environment and currency) and this was then signed by the stand-in authorizer. The crew and authorizer were aware that the aircraft had been defueled to a suitable weight[2] of 1601 kg, as indicated on the Load Sheet, to ensure that the aircraft would be below the AWC standard 1600 kg Max All Up Mass (MAUM) for undertaking EOL training. The authorizer was aware of the EOL wind limitations and specifically how this sortie might be affected by them.

Witness 8
Exhibit 10
Exhibit 8
Exhibit 9
Exhibit 47
Witness 8

1.3.12 The crew gave a normal out-brief in accordance with the ETPS Rotary Out-Brief schedule. The RHS pilot completed the paperwork while the LHS pilot carried out the aircraft walk round. The LHS pilot noticed that one of the Main Rotor Head (MRH) extension arm oil reservoirs appeared to contain oil that was 'blacker' in comparison to the other two. Engineering advice was sought and it was assessed by the technicians that no remedial action was required[3].

Exhibit 10
Exhibit 11
Witness 1
Annex A

Sortie execution

1.3.13 The crew took off at 1131hrs with the intention to conduct EOLs to Rwy 17 Grass; however, once airborne it became apparent that the wind was more suited to Rwy 23 Grass and the crew repositioned for this runway. In accordance with AWC ASOs, a datum autorotation was conducted first to assess the conditions of the day. This was flown at flight idle[4] by the RHS pilot from 500ft, 70kts down to 10ft agl in order to confirm the aircrew's visual picture for the EOLs. It was followed by a powered running landing to confirm the 'skids-level' visual attitude. Although not strictly required, the LHS pilot also flew an autorotation and running landing. During this period of the sortie the crew assessed and agreed that Rwy 23 Grass provided a suitable surface to conduct EOLs in accordance with their orders.

Exhibit 12
Exhibit 13
Exhibit 14
Exhibit 7
Witness 1
Witness 2
Exhibit 14

1.3.14 The RHS pilot conducted his first VF EOL (Fig 2) from 500ft, 65kts and debriefed that he had commenced his flare a little lower than ideal but the landing was acceptable. The LHS pilot then flew the same profile and was debriefed by the RHS pilot that he had commenced the flare even lower, but that the 'check' and 'cushion' to land were fine. There was a brief discussion between the crew as to the pitch attitude of the aircraft on touchdown with the LHS pilot stating he believed the aircraft had landed heels first but the RHS pilot disagreed. The LHS pilot was correct in his assertion as the aircraft had touched down with the nose 3.5° above the skids level attitude,[5] causing the aircraft to rock fore and aft during run-on. The RHS pilot offered the opportunity to repeat the exercise but the LHS pilot elected to continue to the more challenging LLVF EOL as this would allow him to work on his flare height commencement whilst progressing the sortie.

Witness 2
Exhibit 14
Annex C
Witness 1
Witness 2
Exhibit 14

[2] 1600kg Max All Up Mass (MAUM) is an AWC limitation for EOL sorties as stipulated in a Special Flying Instruction. RTS B545 does not permit EOLs above 1800kgs with wind from the right.

[3] The MilAAIB Engineering Investigator also confirmed post-incident that the oil was acceptable.

[4] Engine at Flight Idle and thus available to drive the rotor disc. Profile similar to EOL but crew has option to fly away. Profile must be flown prior to first EOL AWCASO 2315(4)2f.

[5] The FTI pitch data indicates the aircraft is at 3.5° nose up when stationary on the ground and has been assessed as skids level at this figure. This is a datum and all pitch figures have been adjusted to be reference skids level. I.e for this EOL the FTI indicated 7° on touchdown which equates to 3.5° above skids level.

1.3.15 The RHS pilot positioned the aircraft for a LLVF EOL (Fig 2) with entry parameters of 200ft agl and 90kts, completing the manoeuvre without incident. During the 'cushion' the collective reached the Intermediate Pitch Stop (IPS) which corresponds to approximately 75% of its range of travel. Control was handed to the LHS pilot for his first LLVF EOL. During the circuit the crew assessed that the wind gave less than the required 5kts head wind component. This was updated by an Air Traffic Control (ATC) call and confirmed visually from the windsocks; a go-around was then executed. The LHS pilot completed the circuit and set up for a further EOL with the wind having increased to an acceptable level. It was called by ATC as 210° 9kts and the crew visually confirmed sufficient wind from a suitable direction via the windsocks.

Annex C
Exhibit 14
Exhibit 13
Exhibit 6
Exhibit 14

Gazelle EOL – Variable Flare (VF) and Low Level Variable Flare (LLVF)

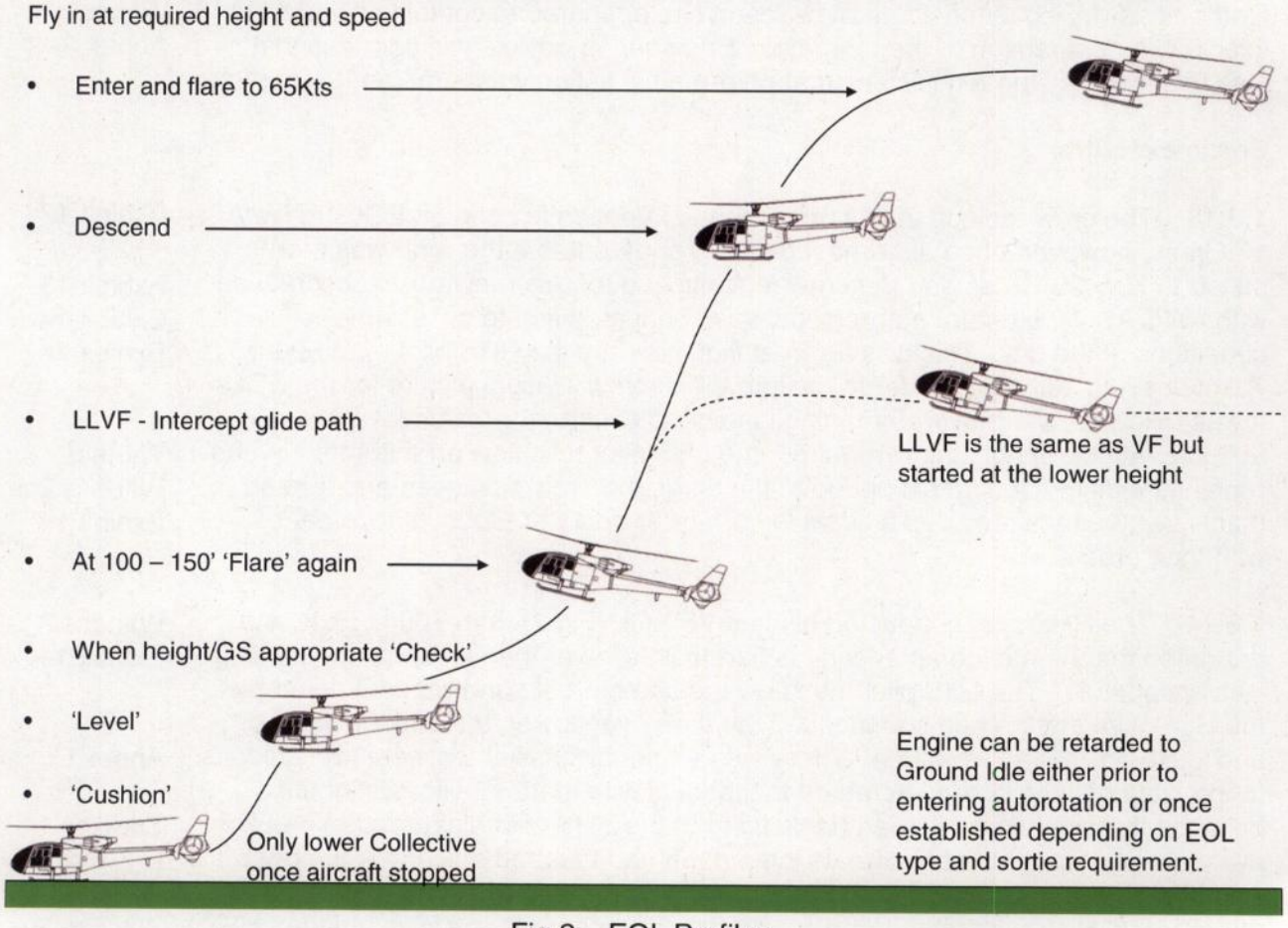

Fig 2 – EOL Profiles

Incident events

1.3.16 **Flare / Check / Level**. The incident EOL was commenced from the same entry conditions (200ft and 90kts). With the first stage flare, the required parameters were achieved. The second stage flare ended with a higher than normal check. This caused the RHS pilot to prompt the LHS pilot "you're a bit high" and the RHS pilot stated that he guarded the collective to ensure that the

Annex C
Exhibit 14
Witness 2

LHS pilot would not raise it too early. After the check the aircraft was initially levelled to the skids level attitude but in the following 2 seconds the attitude rose to approximately 4° above skids level. The LHS pilot stated that he started to raise the collective and was aware that the RHS pilot was following him through[6] on the controls. Both pilots moved the collective toward the max range but were not sure of the extent used. The FTI showed that the High Pitch Stop ((HPS) 100% application) was achieved prior to the aircraft skids contacting the ground. The crew did not recall seeing any abnormal captions on the Central Warning Panel (CWP) prior to the landing[7]. Witness 1 Annex C Witness 1 Witness 2 Annex C Witness 1 Witness 2

1.3.17 **Touchdown**. At the point of touchdown for the incident EOL, Rotor Speed (Nr) was lower than the 2 previous EOLs. The crew reported the touchdown as firm but not alarming. The aircraft touched down at 4.2° above skids level and pitched down approximately 9° to minus 4.9° at a rate of 25°/sec before the nose pitched up again to nearly the same attitude it had on touchdown. This pitching oscillation continued but with decreasing amplitude. Very shortly after the touchdown there were substantial longitudinal cyclic inputs; these longitudinal cyclic inputs were fully aft, then almost central before returning to fully aft until the point of blade impact. The LHS pilot stated that shortly after touchdown the cyclic began to move significantly without his input. Annex C Witness 1

1.3.18 **Rotor RPM decay**. The collective was at the HPS on touchdown and was then reduced in stages progressively over the next 1.4 seconds until it was finally lowered to the Low Pitch Stop (LPS). This was immediately followed by a sudden drop in Nr of 16 rpm, accompanied by increased vertical, lateral and longitudinal accelerations. Annex C

1.3.19 **Blade impact**. The sudden decay in Nr occurred simultaneously with the noise of the initial impact of the MRBs on the tail section which is audible on the Cockpit Voice Recorder (CVR). This was followed by four further audible impacts. Following the Nr decay there were 7 reversals of roll attitude over a short time period before the roll oscillations diminished. During this sequence there was a rapid roll from right to left and back again over 0.8 seconds, with a maximum roll rate of 120°/sec. This rolling motion, coupled with a concurrent pitch down led the crew to believe the aircraft might roll over forward and right. Annex C Witness 1 Witness 2

1.3.20 **Post-impact control movements.** Post the audible impact, the cyclic began to move erratically both laterally and longitudinally following what was described as an oval shape until the motion stopped. There was a single momentary 'spike' in collective, up then down, at the same time as the aircraft achieved its highest rate of roll. Shortly after the impacts there was an involuntary radio transmission (expletive) from the RHS pilot as the aircraft oscillated. Exhibit 14 Annex C Witness 2 Annex C Witness 2 Exhibit 13

1.3.21 **ATC actions**. An ATC witness, in the Visual Control Room, states that he observed the aircraft land, rock forward on its skids before rocking rearwards and subsequently the tail section became detached. Immediately, ATC personnel operated the Crash Alarm. Witness 3

1.3.22 **Crew actions**. The RHS pilot made a call to ATC indicating that they Exhibit 13

[6] 'Following through': The non-handling pilot has a light touch on the controls in preparation to take control if required.

[7] As the engine is shut from flight to ground idle (in autorotation) there will be a minimum of 3 CWP warnings : EngP, Alt and Nav.

were "shutting down" and they required assistance. Both crew vacated the aircraft via their respective doors and no signs of fire were apparent. The crew were met quickly by the rescue services and taken directly to the medical centre for assessment. The crew were released by the SMO back to normal flying duties on 2 Jun 14. Witness 1 Witness 2 Exhibit 15 Exhibit 16

Post-incident events

Escape and survival

1.3.23 As all harnesses, doors and mechanical levers worked correctly there were no escape and survival issues. There were no injuries and the crew exited the aircraft in the normal manner. Annex A Witness 1 Witness 2

1.3.24 The crew wore the correct AEA. The crew stated that they did not have their visors in the down position and that this was standard practice when carrying out EOL training. Witness 1

Post Crash Management (PCM)

1.3.25 MoD Boscombe Down enacted their PCM plan including the impounding of the in-use fuel bowsers. The QinetiQ Airfield Manager and a photographer were allowed access to the site prior to the arrival of the Aircraft Recovery Officer (ARO) and the Military Air Accident Investigation Branch (MilAAIB) Investigators. The ARO re-briefed the photographer on his arrival and prevented any further encroachment within the crash site prior to MilAAIB arrival. MilAAIB Investigators ensured that a number of fuel and oil samples were taken for analysis, including fuel samples from the Bulk Fuel Installation. Similarly, instrumentation components were removed from the aircraft for serviceability and calibration checks. Media presence was limited and the release of information controlled by the PCM Incident Officer (PCMIO). Annex D Annex F Annex A Exhibit 17 Exhibit 18

Salvage operations

1.3.26 MilAAIB Investigators and the Institute of Naval Medicine (INM) arrived at 1500hrs. XZ936 was recovered by a Joint Aircraft Recovery and Transportation Squadron (JARTS) team and relocated into the MilAAIB Hardened Aircraft Shelter at Boscombe Down on 2 Jun 14. The wreckage recovery was in two phases; the removal of the damaged fenestron followed by the aircraft lift and subsequent transportation to the HAS. Annex F

Damage to aircraft, public and civilian property

1.3.27 The rear frame of the tail assembly which houses the fenestron was structurally detached from the tail boom, the only remaining attachment being 3 avionic looms. The vertical stabilisers and left hand horizontal stabiliser were severely damaged. 2 of the tail rotor drive shafts were detached and propelled a distance from the aircraft. Although all 3 MRBs were damaged, one MRB was damaged more significantly, fracturing at the root and splitting along the trailing edge. This blade's Pitch Change Rod (PCR) also broke into 2 pieces and was removed from the aircraft for failure analysis. Annex A Annex A1

1.3.28 During the aircraft assessment by 1710 Naval Air Squadron (NAS), the QinetiQ Non-Destructive Testing (NDT) Team was instructed to conduct NDT on the Transmission Support Platform (TSP). Delamination damage was found in a number of areas on the TSP and the resulting categorisation was CAT 3 (SER)[8]. Annex G Annex A2

1.3.29 A small amount of hydraulic oil (OM15) spilled onto the grassed area as a result of the crash. The impact of this spill on the environment was assessed by the INM in consultation with the Airfield Manager and was categorised as negligible. Annex E

[8] Aircraft repair categories and definitions iaw MAP 01 Ch 9.13.1