To: The Convening Authority

SERVICE INQUIRY INTO THE DEATH OF A CIVILIAN CLIMBER DURING RESCUE 137 ON 25 FEB 13

1. The Service Inquiry Panel assembled at Headquarters Air Command on 28 Feb 13 by order of Air Vice Marshal S Reynolds, Air Officer Commanding 2 Group, for the purpose of investigating the circumstances which lead to the death of a civilian on 25 Feb 13 during Rescue 137 by 202 Squadron, to review the actions carried out immediately afterwards and to make recommendations in order to prevent recurrence. The Panel has concluded its inquiries and submits the provisional report (including the record of proceedings and supporting paperwork) for the Convening Authority's consideration.

PRESIDENT

Wing Commander [redacted] Royal Air Force

Signed ..... Date.....

MEMBERS

Squadron Leader [redacted] Royal Air Force

Signed ..... Date.....

Chief Petty Officer [redacted] Royal Navy

Signed .....Date.....

2. The following inquiry papers are as follows:

Part 1 (The Report)

a. Convening Orders, Terms of Reference and Glossary at 1.2.
b. Narrative of Events at 1.3.
c. Findings at 1.4.
d. Recommendations at 1.5.

Part 2 (The Record of Proceedings)

e. Diary of Events at 2.1.
f. The list of witnesses at 2.2.
g. The witness statements at 2.3.
h. The list of attendees (advisors and observers) at 2.4.
i. The list of exhibits at 2.5.
j. The exhibits at 2.6.
k. The list of Annexes at 2.7.
l. Annexes at 2.8.
m. Schedule of Matters not Germane to the Inquiry at 2.9.
n. Master Schedule at 2.10.
o. An electronic copy of the report and record of proceedings as listed above.

AIR/37006/12/09/13/APC

28 Feb 13

SI President
SI Members
SO2 LEGAD (Ops), DLS
SO1 APC

Copy to:

AOC 2 Gp (PSO)
AOC 1 Gp (PSO)
ACOS Pers Pol (SSIC)
SAR Cdr
Gp Capt DLS
Gp Capt Media & Comms
DRes Sec1
APC Cswk 2 SO2
RAF Lossiemouth (OC PMS)

2 GP CONVENING ORDER FOR A SERVICE INQUIRY CONVENED TO INVESTIGATE THE DEATH OF AN INJURED CIVILIAN CLIMBER ON 25 FEB 13, DURING RESCUE 137 BY 202 SQN ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND.

Reference:

A. JSP 832: Guide to Service Inquiries.

1. A Service Inquiry is to be held under Section 343 of AFA 06 an in accordance with Reference A.

2. The purpose of this Inquiry is to investigate the circumstances which led to the death of a civilian on 25 Feb 13, during Rescue 137 by 202 Sqn, and to review the actions carried out immediately afterwards.

3. The Inquiry panel is to assemble at HQ Air Cmd on 28 Feb 13 at 1030 hrs in AOC 2 Gp's office.

4. The Inquiry panel comprises:

   a. President: Wg Cdr [redacted]

   b. Specialist Member: Sqn Ldr [redacted]

   c. Board Member: CPO Aircrewman [redacted]

5. The legal advisor to the Inquiry is Wg Cdr [redacted] RLO(S), RAF Brize Norton (95461 [redacted]).

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

7. At the discretion of the Convening Authority, advisors/observers may attend the Inquiry in whole or in part; attendance will be subject to such conditions as may be described by the Convening Authority.

8. CO RAF Lossiemouth is requested to provide facilities, equipment and assistance suitable for the nature and duration of the inquiry.

9. Costs are to be met by SAR Lossiemouth using the UIN F0210E.

10. The President of the Inquiry is also to ensure that:

a. Any person whose character may be called into question is to be duly advised under The Armed Forces (Services Inquiries) 2008 Regulation 18. In addition, OC PMS RAF Lossiemouth is to be notified in order for the correct administration procedures[1] to be carried out.

b. All witnesses are to be briefed by the President of the Service Inquiry in accordance with paragraph 4.22 of JSP 832.

c. If it is suspected that a Service offence has been committed, the Service Police should be informed immediately.

d. The report is to avoid the explicit attribution of blame, assertion of negligence, or legal liability to any witness.

e. If at any time the President is unable to perform the role, OC PMS RAF Lossiemouth should be informed immediately.

11. The proceedings are to be reported in accordance with JSP 832. The President should communicate his initial findings to the Convening Authority within 96 hours of this SI being convened and provide a Progress Report every 30 days thereafter.

12. The completed Inquiry should be forwarded through OC PMS RAF Lossiemouth to SO2 Cswrk 2, HQ Air Cmd, for staffing without delay, prior to submission to the Convening Authority, and bearing any security grading which is considered appropriate.

[redacted]

S Reynolds
AVM
AOC 2 Gp

Annex:

A. Terms of Reference for a Service Inquiry Convened to Investigate the Death of an Injured Civilian Climber on 25 Feb 13, during Rescue 137 by 202 Sqn on the Ben Nevis Mountain Range, Scotland.

[1] OC PMS is to inform SO2 2, APC and confirm CoC have been informed and appropriate support in place.

ANNEX A to
AIR/37006/12/01/13/APC
Dated 28 Feb 13

AIR/37006/12/09/13/APC

28 Feb 13

Wg Cdr [redacted]

TERMS OF REFERENCE FOR A SERVICE INQUIRY CONVENED TO INVESTIGATE THE DEATH OF AN INJURED CIVILIAN CLIMBER WHICH 25 FEB 13, DURING RESCUE 137 BY 202 SQN ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND.

1. You are appointed as the Investigating Officer of a Service Inquiry to be convened at HQ Air Command on 28 Feb 13 at 1030 hrs. The Inquiry is to investigate the death of an injured civilian climber on 25 Feb 13, that occurred during Rescue 137 by 202 Sqn on the Ben Nevis Mountain Range, Scotland.

2. Your Terms of Reference are to:

a. Establish the details of the incident (when, where, and what happened).

b. Set the context for the activity taking place in which the incident occurred.

c. Determine the cause of the incident and examine any contributory factors.

d. Investigate and comment on any fatigue implications of an individual's activities prior[2] to the matter under investigation.

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

f. Examine what orders and instructions were issued and whether they were complied with.

g Determine state and serviceability of relevant equipment.

h. Establish the level of training, relevant competences and qualifications of the individuals involved in the incident.

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

j. Identify if the levels of planning and preparation met the activity's objectives.

k. Review the levels of authority and supervision covering a task during which the matter occurred.

l. Determine if Service Kit was deficient or defective.

[2] This may be for as short a period as the days just prior to the matter or for a prolonged period building up to the matter.

m. Make appropriate recommendations.

n. Notify OC PMS RAF Lossiemouth of any person whose character may be affected by the findings of the Panel iaw The Armed Forces (Services Inquiries) 2008 Regulation 18.

o. Make appropriate recommendations in the President's Report. Additionally, the President is to ensure that all recommendations are inputted to Defence Lessons Identified Management System (DLIMS) with the support of SO2 Lessons Cell, HQ Air.

3. You are to conduct the Inquiry iaw JSP 832. In particular you are to note that no attribution of blame or assertion of negligence or legal liability is to be apportioned to any witness during the Inquiry.

I have read and understood these Terms of Reference.

[redacted]

[redacted]

Wg Cdr
SI President

AIR/37006/12/09/13/APC

20 Mar 13

Wg Cdr [redacted]

AMENDMENT TO TERMS OF REFERENCE FOR A SERVICE INQUIRY CONVENED TO INVESTIGATE THE DEATH OF A CIVILIAN CLIMBER DURING RESCUE 137 ON 25 FEB 13

References:

A. Telecon 20 Mar 1430Z AOC 2 Gp/Wg Cdr [redacted]
B. Annex A to AIR/37006/12/09/13/APC dated 28 Feb 13

1. At Ref A you made me aware of your concern over witness testimony that may indicate the influence of SARF cultural/organizational issues over the incident under investigation. Accordingly, your TORs (Ref B) are amended to include the following additional requirement:

a. Determine and comment on any broader contributory organizational and/or SARF cultural factors.

[redacted]
S K P Reynolds
AVM
AOC 2 Gp

I have read and understood the additional Term of Reference.

[redacted]
Wg Cdr
SI President

Air/37006/12/09/13/APC

2 May 13

SI President
SI Members

Copy to:

AOC 2Gp (PSO)

AMENDMENT TO THE 2GP CONVENING ORDER FOR A SERVICE INQUIRY CONVENED TO INVESTIGATE THE DEATH OF A CIVILIAN CLIMBER DURING RESCUE 137 ON 25 FEB 13

References:

A. Email to AOC 2Gp (PSO) 021232Z May 13.
B. Air/37006/12/09/13/APC dated 28 Feb 13.

1. At Ref A you made me aware of your requirement for a Service Inquiry Advisor to provide professional knowledge of the inquiry process, specifically the compilation of the Provisional Report and the Record of Proceedings. Accordingly, Ref B is amended to permit an MAAIB Investigator, Sqn Ldr [redacted] to attend the inquiry during panel deliberations.

[redacted]
S K P Reynolds
AVM
AOC 2Gp

AIR/370006/12/09/13/APC

28 Aug 13

SI President

Copy to:

APC Cswrk 2 SO2

COMPLETION OF DUTIES AS PRESIDENT OF THE SERVICE INQUIRY PANEL – INVESIGATION INTO THE DEATH OF AN INJURED CIVILIAN CLIMBER ON 25 FEB 13, DURING RESCUE 137 BY 202 SQN ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND

1. In accordance with JSP 832 (Guide to Service Inquiries), on 28 Feb 13, I appointed you to act as the President of the Service Inquiry Panel to investigate the circumstances surrounding the death of an injured civilian climber on 25 Feb 13, during Rescue 137 by 202 Sqn on the Ben Nevis mountain range.

2. [redacted] your valued services are now no longer required to act as the President, therefore I hereby formally declare that your duties as President of the Service Inquiry have been completed. Consequently, under section 6(2) of the Armed Forces (Service Inquiries) Regulations 2008, I have now appointed a new President to continue the investigation.

3. May I take this opportunity to give my sincere thanks to you for being such an effective President in what appears, through your regular updates, to be a very thorough and well conducted inquiry to date.

[redacted]
S Reynolds
AVM
AOC 2 Gp and COS Ops

AIR/37006/12/09/13/APC

28 Aug 13

Wg Cdr [redacted]

APPOINTMENT AS SERVICE INQUIRY PRESIDENT – TO INVESTIGATE THE DEATH OF AN INJURED CIVILIAN CLIMBER ON 25 FEB 13, DURING RESCUE 137 BY 202 SQN ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND.

1. A Service Inquiry (SI) to investigate the circumstances surrounding the death of an injured civilian climber on 25 Feb 13, during Rescue 137 by 202 Sqn, was convened by me on 28 Feb 13 (Annex A). The President of the SI is no longer available and therefore, in accordance with Regulation 6(2) of the Armed Forces (Service Inquiries) Regulations 2008 ("the Regulations"), I must appoint a new President.

2. In accordance with Regulation 6(3) of the Regulations, you are hereby appointed as President of the SI Panel in order to complete the investigation. I invite you to note that:

   a. MAAIB Investigator, Sqn Ldr [redacted] is permitted to attend the SI during panel deliberations[1].

3. Your Terms of Reference (TORs) appear at Annex B.

[redacted]
S Reynolds
AVM
AOC 2 Gp and COS Ops

Annexes:

A. Convening Order, dated 28 Feb 13, to investigate the circumstances which led to the death of a civilian on 25 Feb 13, during Rescue 137 by 202 Sqn.

B. Terms of Reference, dated 28 Aug 13, for a Service Inquiry convened to investigate the death of an injured civilian climber on 25 Feb 13, during Rescue 137 by 202 Sqn on the Ben Nevis Mountain Range, Scotland.

[1] Amendment of 2Gp Convening Order dated 2 May 13.

ANNEX B to
AIR/37006/12/01/13/APC
Dated 28 Aug 13

AIR/37006/12/01/13/APC

28 Aug 13

Wg Cdr [redacted]

TERMS OF REFERENCE FOR A SERVICE INQUIRY CONVENED TO INVESTIGATE THE DEATH OF AN INJURED CIVILIAN CLIMBER WHICH 25 FEB 13, DURING RESCUE 137 BY 202 SQN ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND.

1. You are appointed as the Investigating Officer of a Service Inquiry which was convened at HQ Air Command on 28 Feb 13 at 1030 hrs. The Inquiry is to investigate the death of an injured civilian climber on 25 Feb 13, that occurred during Rescue 137 by 202 Sqn on the Ben Nevis Mountain Range, Scotland.

2. Your Terms of Reference are to:

a. Establish the details of the incident (when, where, and what happened).

b. Set the context for the activity taking place in which the incident occurred.

c. Determine the cause of the incident and examine any contributory factors.

d. Investigate and comment on any fatigue implications of an individual's activities prior[2] to the matter under investigation.

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

f. Examine what orders and instructions were issued and whether they were complied with.

g Determine state and serviceability of relevant equipment.

h. Establish the level of training, relevant competences and qualifications of the individuals involved in the incident.

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

j. Identify if the levels of planning and preparation met the activity's objectives.

k. Review the levels of authority and supervision covering a task during which the matter occurred.

l. Determine if Service Kit was deficient or defective.

m. Make appropriate recommendations.

[2] This may be for as short a period as the days just prior to the matter or for a prolonged period building up to the matter.

n. Notify OC PMS RAF Lossiemouth of any person whose character may be affected by the findings of the Panel iaw The Armed Forces (Services Inquiries) 2008 Regulation 18.

o. Make appropriate recommendations in the President's Report. Additionally, the President is to ensure that all recommendations are inputted to Defence Lessons Identified Management System (DLIMS) with the support of SO2 Lessons Cell, HQ Air.

3. You are to conduct the Inquiry iaw JSP 832. In particular you are to note that no attribution of blame or assertion of negligence or legal liability is to be apportioned to any witness during the Inquiry.

I have read and understood these Terms of Reference:

[redacted]

Wg Cdr
SJ President

GLOSSARY

Abbreviation	Definition
22 Sqn	22 Squadron.
202 Sqn	202 Squadron.
ac	Aircraft.
Airwave	Airwave Communication System, carry-on equipment providing communications through the ac intercom on the Airwave network used by other emergency services. It allows standard telephone calls to the public service telephone network and to mobile telephones.
Anchor	A piece of equipment used in climbing to which a rope or runner may be attached to provide security in the event of a fall.
ARCC	Air Rescue Coordination Centre.
Belay	To secure (a person) by attaching to one end of a rope; to secure a rope by attaching to a person or to an object offering stable support.
CB	Circuit-Breaker, a device to allow a piece of equipment on an ac to be electrically isolated.
CR	Combat Ready, the operational category awarded to aircrew that have an average standard of operating ability and professional knowledge.
CR(A)	Combat Ready (Advanced), the operational category awarded to aircrew that have an above-average standard of operating ability and professional knowledge.
CVFDR	Cockpit Voice and Flight Data Recorder.
D Flt	D Flight, one of 3 flights (sub-divisions) of 202 Sqn. 202 Sqn provides helicopter SAR cover to northern England and Scotland through 3 flights based at RAF Lossiemouth, RAF Boulmer and Leconfield.
E	Exhibit.
FLIR	Forward-Looking Infra-Red. The Sea King HAR Mk3 is fitted with the STAR Q Multi-Sensor System, referred to as 'the FLIR'. The system provides an Infra-Rad (IR) thermal-imaging sensor, a daylight TV camera and the facility to record IR or TV images onto digital tape.
Flt	Flight, a sub-division of a squadron.
FTRS	Full-Time Reserve Service, personnel from the RAF Reserve employed full-time to augment the regular forces.
GP	General Practitioner.
HF	High Frequency (radio) or Human Factors.
HQ	Headquarters.
Ice screw	A threaded tubular screw used as a running belay or anchor by climbers on steep ice surface such as steep waterfall ice or alpine ice during ice-climbing.
ISpec	Instructional Specification. A document which articulates what is to be covered during a formal training event.
J-knife	A knife in the shape of a letter J, with protected double blades, designed specifically for cutting webbing seat straps and parachute cords in the rescue of downed aircrew.
JFIG	Joint Forces Intelligence Group.
JSP	Joint Service Publication.
Karabiner	A karabiner (or carabiner) is a metal loop with a spring loaded gate used to quickly and reversibly connect components in safety-critical systems.
lbs	Pounds weight.
MilAAIB	Military Air Accident Investigation Branch.
MOD	Ministry Of Defence.
MRT	Mountain Rescue Team.
OC	Officer Commanding.
OCU	Operational Conversion Unit, the training unit that converts aircrew to their front-line ac type and provides operational role training.
Operational Captaincy	Awarded to pilots that have the required skills to perform the duties of an ac captain on SAR operations and to act as their Flight Commander's representative to run a 24-hr SAR shift.
Ops	Operations.

Abbreviation	Definition
OTG	Overspeed Trip Governor, an electronic device designed to prevent the Sea King engines from overspeeding.
Pitch	The word 'pitch' is used in climbing to describe a section of a complete climbing route up a mountain or cliff.
QHCI	Qualified Helicopter Crewman Instructor.
R (as in 203(R) Sqn)	Reserve, indicating that a squadron is not a front-line squadron but (in this case) a training unit.
RadOp	Radar/Operator, the member of the Sea King helicopter crew responsible for operating the sensor suite and the winch.
RAF	Royal Air Force.
RTO	Rearcrew Training Officer.
RN	Royal Navy.
Runner	A runner is an item of climbing equipment consisting of a tied or sewn loop of webbing. Amongst other things, they may be used as anchors or to extend an anchor to reduce rope drag. Those used by the climbers in the incident were mostly 'quickdraws'; consisting of 2 non-locking carabiners connected together by a short, pre-sewn loop of webbing.
SAR	Search And Rescue.
SARF	Search And Rescue Force, consisting of all assets assigned to provide a 24-hr SAR service covering the landmass and waters within the UK SAR Region. Key elements are: RAF Sea King helicopters of 22 and 202 Sqns; RN Sea King helicopters at 2 UK locations; 4 Maritime and Coastguard Agency units; 4 RAF MRTs; the ARCC; and the SARF HQ located at RAF Valley.
SAROP	Search And Rescue Operation.
Sling	A sling or runner is an item of climbing equipment consisting of a tied or sewn loop of webbing. These can be wrapped around sections of rock, hitched to other pieces of equipment, or tied directly to a tensioned line using a Prusik style knot.
SOP	Standard Operating Procedure.
SPOAK	Single Point Of Attachment Karabiner.
Sqn	Squadron.
STANEVAL	STANdards and EVALuation, the unit responsible to the SARF Commander for the evaluation of operational capability, training and standardisation within the SARF.
T-Cat	Training Category, a qualification awarded to aircrew deemed suitable to train other aircrew who are already qualified.
TRiM	Trauma Risk Management.
W	Witness.
WTO	Winchman Training Officer.

PART 1.3 NARRATIVE OF EVENTS

(All times Zulu)

1. **Introduction.** On 25 Feb 13 the crew of a Royal Air Force (RAF) Sea King (Rescue 137) was diverted from a training sortie onto a Search And Rescue (SAR) mission to rescue a fallen climber on Ben Nevis. After refuelling at RAF Lossiemouth, the helicopter flew to the scene of the fall. En-route, the Winchman spoke to one of the climbers by mobile phone[1] and ascertained that the fallen climber was secured by 2 ropes, was held upside-down and was losing sensation in one of his legs. The Winchman made clear to the climber that he would need to cut ropes to rescue the Casualty and that all party members would need to ensure their own security on the rock face. Arriving on-scene, the crew conducted a brief search before locating the Casualty and his climbing partner. Having considered the option to fetch the Lochaber Mountain Rescue Team (MRT) to the scene, the crew elected to carry out a reconnaissance (recce) with a view to conducting the rescue themselves; having judged that the time the MRT would take to carry out the rescue might prejudice the Casualty's survival. Accordingly, the Winchman prepared for a winch rescue using a double lift with 2 strops. Established in the hover in close proximity to the cliff, the crew lowered the Winchman towards the 2nd Climber, then to the Casualty. The Winchman placed the strops on the Casualty but, mindful both of the risk associated with attaching the helicopter to the hillside through the climber and the number of ropes that he had to cut, he did not connect the strops to the winch hook. Having elected to cut away a rope that appeared to him to be uninvolved in the security of the Casualty (and having visually confirmed with the 2nd Climber that it would be acceptable to do so), the Winchman used his J-knife to sever it. The Casualty immediately fell approximately 1000 ft[2] and sustained fatal injuries. E15, E50, W2

Climbing party

2. On 25 Feb 13 at approximately 0915, the Casualty and a 2nd Climber began climbing a route called Raeburn's Buttress Direct, in a gully on the North side of Ben Nevis (a map of the area around the incident showing key locations is provided at Figure 1). The weather and climbing conditions were very good, with little or no wind. Both climbers were experienced, in recent climbing practice and equipped with harnesses, helmets, rigid crampons, a pair of ice axes each, and protective equipment; including ice screws, rock wires and two 60 m ropes[3]. W4, E34, E37

[1] Utilising the Airwave Communication System which enables calls to the public service telephone network via the ac intercom.
[2] Estimated from the positions prior to and after the fall, using OS Map Sheet 41, the original grid reference provided to the crew of Rescue 137 and a photograph of the Casualty's final position after the fatal fall.
[3] One yellow and one blue.

E15, E42, E49, E50

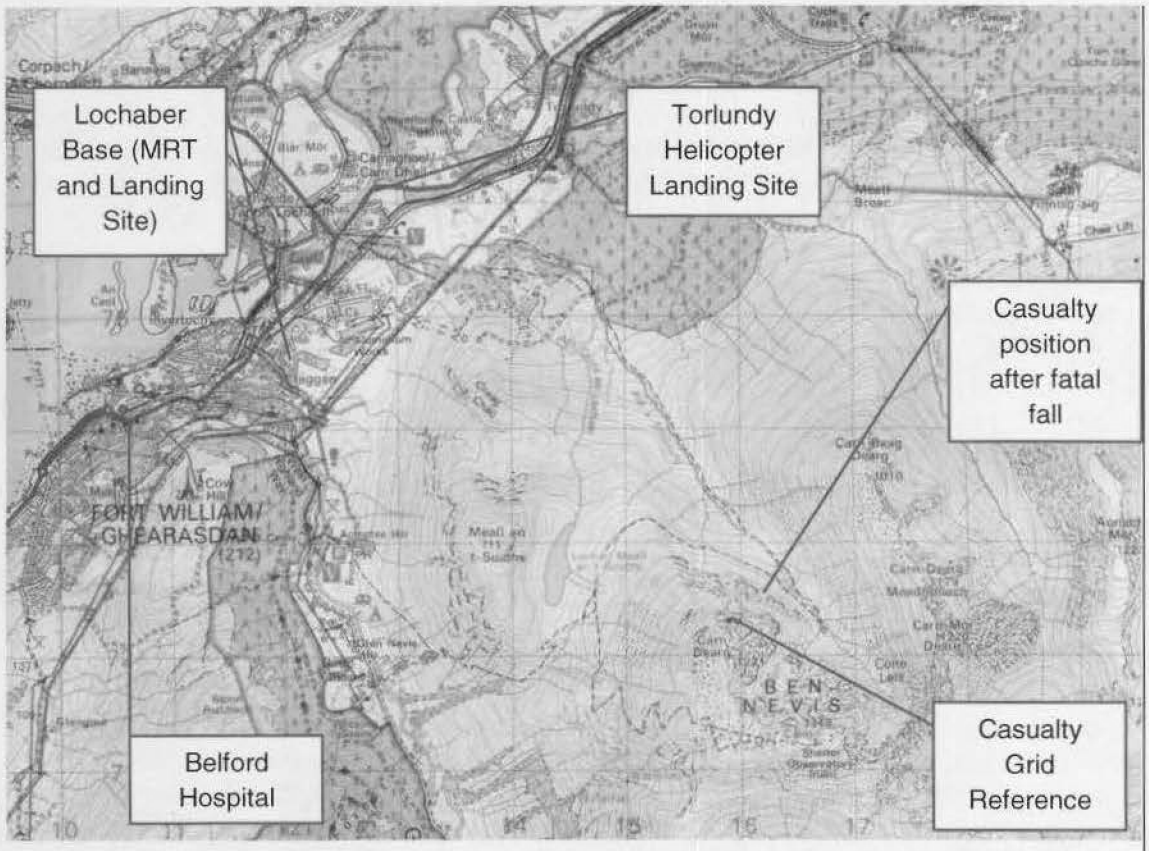

Figure 1 – Map of the incident area

3. The climbers ascended the first 2 pitches[4] of the climb utilising a dual half-rope arrangement as their belay system[5]. The 2nd Climber led the first pitch and the Casualty led the next, during which they were passed by a Free Climber who observed them to be climbing well and without difficulty. The climbers then began climbing the third pitch, led by the Casualty. The 2nd Climber was secured to a good belay and was running two 60 m climbing ropes, one blue and one yellow, through a belay device up to the Casualty. As he climbed, the Casualty placed ice screws to his left and right, clipped to the ropes via runners, with the yellow rope running up the left side of the climb and the blue rope running up the right. Around a third of the way up the pitch the Casualty was photographed by the Free Climber. The Casualty had climbed approximately 50 m above the 2nd Climber when he asked him to move his belay position. The 2nd Climber achieved this and re-belayed himself, anchoring his harness to a peg in the rock with a sling. The Casualty climbed a little further when

W4, E18, E19, E37, E43, E60, E61

[4] The word 'pitch' is used in climbing to describe a section of a complete climbing route up a mountain or cliff.
[5] As the lead climber ascends, he places ice screws in the ice which act as anchors in the event of a fall. These are then connected to the climbing rope via 'runners' consisting of a piece of nylon tape with a karabiner at each end. One karabiner is attached to the ice screw; the other is clipped around the climbing rope. The lead climber alternates placing ice screws either side of his line of climb, using one rope on the left and one on the right; thereby reducing friction caused by excessive rope bending. The lower climber (the 'second') remains at the base of the climb, anchored by his harness to a belay point with both ropes running through a single belay device. In the event of a fall, the lead climber will drop until his weight is held by the second, via the rope running to the highest anchor. Should the highest anchor pull out of the ice, the lead climber will fall until the next anchor (and so on in the case of multiple failures). When anchors fail, the relevant runners remain attached to the rope and will slide either to the waist harness of the lead climber or down to the next runner.

the 2nd Climber heard him fall, at approximately 1230[6]. The Casualty had placed at least 5 ice screws in total between himself and the 2nd Climber before the fall.

4. The fall was also heard by a Guide who was approximately 100 m above on a different route (Boomer's Requiem). The 2nd Climber arrested the fall and the Casualty came to rest in a prone position in a narrow gully approximately 10 m above and to the right of the 2nd Climber. The 2nd Climber locked and tied off the belay device for the yellow rope which was holding all of the Casualty's weight. He took in the slack on the blue rope, pulling through approximately 25-30 m of rope before tying it off. He called to the Casualty, who did not respond. The 2nd Climber then shouted for help a few times. These calls were heard by the Guide who called 999 and reported his own location and an estimate of the climbers' position. The 2nd Climber then also called 999 and spoke to both the civilian Police at Fort William and the Lochaber MRT. E2, E34, E37, E38, W4

5. A few minutes after the fall, the Casualty started to regain consciousness although was initially unaware of his situation and what had happened. Having reassured him that a rescue team was on its way, the 2nd Climber attempted to ascertain the extent of the Casualty's injuries. The Casualty confirmed that he was in pain, had a loss of sensation in his legs but had not suffered any head injuries; a conversation that was heard both by the Guide and his own climbing partner who was a qualified General Practitioner (GP)[7]. The 2nd Climber then received a call from the SAR helicopter, Rescue 137. Whilst communications were difficult due to the background noise of the helicopter, the 2nd Climber answered what he believed to be a series of standard questions from the Winchman, including: confirmation of the Casualty's condition; how many ropes were holding him; and whether or not the ropes could be cut[8]. W2, W4, E34, E38, E45

6. After the telephone call to the helicopter the 2nd Climber continued to reassure the Casualty who complained of the pain in his leg and asked to be moved. This was difficult for the 2nd Climber, having tied off the rope with a figure-of-eight knot (which is difficult to untie when weighted). However, he eventually managed to lower the Casualty by moving the belay point closer to the Casualty; albeit only a short distance as he was using a 120 cm sling to attach to the belay. Having done so, he could see the Casualty more clearly; the Casualty being some 7-8 m diagonally above him. He could see that the Casualty's leg was misshapen, but could see no signs of blood in the vicinity. After his initial confusion the coherency of the Casualty had improved and he was clearly able to understand what was being said to him. W4, E37

7. In his final position, the Casualty was lying on his right side, in against the ice within a narrow gully. He was held by 2 ropes; a yellow rope under tension and bearing his weight, and a blue rope. The blue rope was not holding any significant element of the Casualty's weight; moreover, whilst the majority of the slack had been taken in from it, there was an element of slack in the blue rope below the Casualty due to the move in the 2nd Climber's belay position. The 2nd Climber estimated that at least one anchor was holding on the yellow system and at least 3 ice screws were still W4, E2, E37, E38

[6] Deduced from the time of the Police telephone call reporting the incident to the ARCC.
[7] The fact that the Casualty was talking reassured the GP that his airway was clear and that he was breathing satisfactorily.
[8] Of note, the 2nd Climber thought that the latter question was with respect to his own safety and considered it obvious that the ropes would have to be cut in order to winch the Casualty up. He therefore confirmed that he was secure and that it would be acceptable to cut the ropes.

attached in the blue system. The yellow rope ran up the left side of the gully from the 2nd Climber, out-of-sight and through at least one anchor point before running back down to the Casualty. The blue rope ran up the right side of the gully from the 2nd Climber, through a runner, past the Casualty's lower body, up out-of-sight through unseen anchor points before running back down to the Casualty. Established in this position, the 2nd Climber waited for the arrival of the helicopter.

Sea King XZ585, Rescue 137

8. **Crew background.** The crew composition of Sea King XZ585 (Rescue 137) was standard for an RAF SAR Sea King and comprised a Pilot, who was also the Captain, a Co-pilot, a Radar Operator (RadOp), who was also the winch operator, and a Winchman. E4, E5, E6, E7, E27, E36, E68, E69, E70, E78, W2

a. **Captain.** [redacted]

b. **Co-pilot.** [redacted]

c. **RadOp.** [redacted]

d. **Winchman.** [redacted]

[9] Combat Ready (CR) is the normal operating standard achieved by RAF aircrew. Aircrew who have recently qualified (or re-qualified) are awarded Limited Combat Ready (LCR) status and would typically be expected to achieve CR 6 months after arriving on a squadron. CR(A) is awarded to those aircrew who achieve an operating standard that is Above-the-Average; it is a significant achievement by the individual and the standard is not reached by all operators.

[redacted]

Events prior to the accident

9. The crew was on its second in a sequence of three 24-hr shifts. On the previous shift (23/24 Feb) the crew had been scrambled 3 times during the day with the last landing at 1940. After a normal night's sleep in the Sqn accommodation, the pilots flew a maintenance test flight before handing over to the oncoming crew at 0920. All of the crew then had the rest of the day off-duty and were well-rested before reporting ready to take over duty again on 25 Feb at approximately 0830. After carrying out their normal shift handover tasks[10], the crew took over SAR duty at 0920. E8, E9, E33, W1, W2, W3, W5

Supervision and authorisation

10. The Captain self-authorised to cover SAR Operations (SAROPs) for the whole shift; he also self-authorised for a training sortie to be conducted post acceptance of the SAR duty[11]. The Duty Supervisor[12] was the off-going captain although Officer Commanding (OC) D Flight (Flt) 202 Sqn took over the duty shortly thereafter. The Captain briefed him on the plan to conduct a training sortie. W1, W6

Accident events

11. The crew elected to complete a maritime training sortie in the morning and briefed accordingly. The ac took off at 1101 and the crew completed some deck-winching followed by a 'drums' exercise[13]. At 1244 the crew received a call from the Air Rescue Coordination Centre (ARCC) on the High Frequency (HF) radio alerting them to a SAROP. The initial call contained no details of the task and the crew recovered the drum. Knowing that a refuel would be required, the Captain elected to return to RAF Lossiemouth pending further details from the ARCC. Once on the ground, the crew commenced a rotors-running re-fuel. E1, E2, E51, W1, W3, W5

12. At 1249 the crew received another HF radio call from the ARCC. The Co-pilot took the call and was informed that a 51-year old climber had fallen 150 m while climbing Ben Nevis. The ARCC passed an accurate grid reference and told the crew to expect further details. The pilots confirmed that they would be on the ground for a further 10 mins refuelling. While the pilots and Winchman carried out the rotors-running refuel the RadOp went into the Sqn Operations Building to see what further information he could gather. The ac was refuelled to 2300 lbs of fuel, the RadOp re-boarded and the ac took off again at 1300. Having plotted the grid reference as being on the North-Western side of Ben Nevis, the crew planned to route South of Inverness then down the Great Glen before turning South to Ben Nevis. The RadOp informed the crew that there might be a first informant on-scene and passed 2 mobile phone numbers to the Co-pilot; one for the first informant (the Guide) and one for a second informant (the 2nd Climber). He also passed that the weather was good on-scene. E2, E15, E51, E74, W3, W5

---

[10] In accordance with SAR Force (SARF) Standard Operating Procedures (SOPs) Sea King Mk 3 & Mk3A Edition 2 and 202 Sqn Order Book Edition 3 AL1.
[11] In accordance with SARF Orders Sea King Edition 3 Change 2 SARFSK2306 and Temporary Order SARFSK2306.100.1.
[12] In accordance with SARF Orders Sea King Edition 3 Change 2 SARFSK2305 and 202 Sqn Order Book Edition 3 AL1 2.14.
[13] 'Drums' refers to a wooden cruciform used to replicate a survivor in the water on which the crew can practice winching operations.

13. During the initial part of the transit the rear-crew changed from their maritime equipment into mountain clothing and believing that the SAROP was on the benign, sloping side of Ben Nevis started to prepare for a stretcher recovery. At 1309 the crew conducted a wash-up, bringing all of the information gathered so far together and updating all 4 crew members. The Co-pilot briefed the details and the crew then noted that the location was not on the benign side of Ben Nevis but rather the precipitous North Face. The crew abandoned the plan for a stretcher rescue and decided to make an 'Airwave' telephone call to the 2nd Climber. E2, E51

14. At 1323 the Winchman made a telephone call to the 2nd Climber using the 'Airwave' system. The remainder of the crew elected not to listen to the call in order to prevent distraction; accordingly the Winchman asked for 'Private'[14] on the intercom system. The call lasted 7 mins and as soon as it was over the Winchman briefed the following key points to the crew: E2, E51

a. The plan to use the stretcher was "out the window".

b. The rescue was "going to be a rope-cutting exercise".

c. The Casualty had "2 ropes securing him to the hill" and was "upside-down over a significant drop".

d. The situation was snowy so he was going to put his crampons on.

e. The Casualty did not have any significant fractures, nor did he report neck or back pain, but he did report losing feeling in his legs.

f. The Casualty had fallen "15 or 20 m".

g. The 2nd Climber was 20 m above the Casualty.

The Winchman finished his brief by stating that in the event that a rescue attempt was deemed feasible, his plan would be to: secure the Casualty with 2 rescue strops off the winch hook; clip the strops to the winch hook; and then cut the ropes. He noted that the Casualty's position would preclude carrying out any first-aid on scene but that the stretcher should be pre-prepared so that the Casualty could be placed in it immediately upon arrival in the ac. Accordingly, the Winchman and RadOp began to re-configure the cabin based on the new plan.

15. En-route down the Great Glen the Co-pilot called the Lochaber MRT on the radio, confirming the crew's intention to go directly to the incident location with a view to completing the rescue un-aided. The MRT confirmed that 12 team members had mustered and that given the Casualty's position on the North Face it was their opinion that the job might be very difficult for the helicopter to complete on its own. The Co-pilot responded by re-emphasising that the intention was to take a look and get back to the MRT only if the situation was assessed as "precarious". Following the radio conversation with Lochaber Base, the crew briefly discussed their decision not to involve the MRT in the rescue. Mindful of the time it would take the MRT to get to the Casualty the crew agreed to proceed with their original plan. However, the Captain E2, E51

[14] Noting the relevant switch is in the ac cockpit.

concluded the discussion by emphasising that the option to involve the MRT remained open; stating to the Winchman that "you can't compromise your safety or anybody's safety".

16. The crew called the ARCC to report on-scene at 1338, called the Lochaber MRT to pre-arrange an ambulance at Torlundy, then completed a Power Check[15] which was satisfactory. At this time the wind was noted to be 4 kts. The Winchman reiterated his plan to connect the rescue strops to the winch hook before cutting the ropes but underlined that the strops would not be connected "until the very last second". He also stated that he had been informed that only one of the ropes was under tension and that the other was "flopping about". The ac commenced its search at 1344, starting at 3500 ft Above Mean Sea Level (AMSL). Nothing significant was seen from a hover at that height so the helicopter descended, orbiting left and coming to a second hover at 3200 ft AMSL. As the helicopter reached the lower height the crew spotted the 2nd Climber waving his arm at them and pointing towards the Casualty. Shortly thereafter, at 1348, the crew spotted the Casualty. The Winchman then stated that the crew should be looking for a party of 3 climbers[16]; the crew did not respond to this statement. E2, E12, E51, W1

17. The pilots completed the First Hover Checks[17], noting that there was very little wind, engine torque was stable at 80-85% and that any flyaway[18] would be flown down and left. At this point, the Winchman expressed reservations concerning cutting the climbing ropes, based on his concern for the security of the 2nd Climber and the fact that he could not see a third climber. The crew discussed what might have happened to the third climber; the RadOp postulating that the climber previously reported to have been above the Casualty may have climbed down to become the climber below (2nd Climber) and noting that no other climbers were visible. The Captain stated that it might become clearer once the Winchman was lowered closer to conduct a recce. Consequently, the RadOp completed a Detailed Recce[19] brief, noting that there was going to be very little footing for the Winchman and that he would thus be hanging on the winch cable throughout. The Captain then briefed the 'Pilot 3Hs' (Hazards, Heading, Height); stating that the Hazards were mostly to the Winchman and emphasising that he had to be "completely happy" before leaving the helicopter or cutting any ropes. In addition, the Captain re-emphasised that any flyaway would have to be "aggressive" due to the proximity of a large buttress of rock directly ahead of the ac. E2, E11, E12, E51, W1

18. The crew then began the Method Brief[20], with the RadOp planning to lower the Winchman to the Casualty from the overhead. This was modified by the Winchman, who preferred to go in horizontally in order to enable him to "appraise the ropes" on his way in. The Method Brief was then further interrupted by the Winchman who E2, E12, E13, E50 E51, W1, W2, W3

---

[15] The 'Power Check' is a standard check defined in SARF SOPs Sea King Mk3 & Mk3A Edition 2 Chapter 2 (Exhibit 12) to ensure that the helicopter has adequate power margin in the hover to complete the task.
[16] An impression formed by the Winchman during the Airwave call with the 2nd Climber; albeit it is worth noting that neither the ARCC nor the 2nd Climber quantified the number of climbers involved.
[17] In accordance with Sea King HAR Mk3 Flight Reference Cards Issue 7 AL9 ANA42.
[18] The 'flyaway' is a hover condition defined in SARF SOPs Sea King Mk3 & Mk3A Edition 2 Chapter 2 Annex A (Exhibit 11). It indicates that in the event of the total loss of power from one engine, the pilot will have to dive the ac to gain airspeed in order to regain level flight. If the helicopter is operating close to an obstacle, such as the hillside, it may have to turn away to avoid it at the same time. When the pilot briefs the helicopter to be in a flyaway condition, therefore, he will usually also brief the safe flyaway direction.
[19] The 'Detailed Recce' is a standard brief defined in SARF SOPs Sea King Mk3 & Mk3A Edition 2 Chapter 2 (Exhibit 12). It is completed by the RadOp and is used to carry out a close scrutiny of the situation.

having seen the Casualty's exact position expressed concern at the potential complexity of the rescue; raising again the option of involving the MRT. The Captain proposed that the Winchman take a look and that if he then felt that it was too difficult he could winch back up and the crew would get the MRT. After a short pause to consider, the Winchman agreed and the Method Brief was re-started (1354) and completed. At the end of the brief the Co-pilot stated that they had 20 mins remaining on-scene. The Co-Pilot then completed the Pre-Winching checks[21] and the RadOp checked the Winchman who was equipped to lift the Casualty using a double lift with 2 strops[22] (Figure 2). Given the location of the Casualty the Winchman elected to use a Single Point Of Attachment Karabiner (SPOAK) (Figure 3) for each strop and had 'broken' the second strop to ease its use (Figure 4). Just before he left the helicopter, the Winchman amended the plan, stating that he wanted to be lowered to the 2nd Climber first; thereby enabling him to verbally confirm with the 2nd Climber that cutting the yellow rope was "not going to cause an issue". The RadOp acknowledged this request and at 1356 winching commenced.

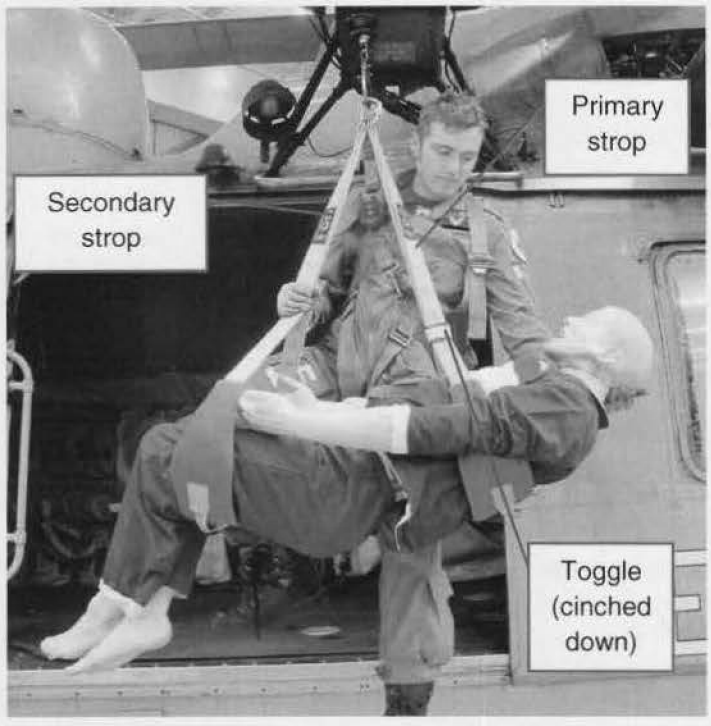

Figure 2 – Dummy in double lift with 2 strops

[20] The 'Method Brief' is a standard brief defined in SARF SOPs Sea King Mk3 & Mk3A Edition 2 Chapter 2 (Exhibit 12). It covers the means of delivering the winchman to the survivor, their recovery and any associated ac positioning.
[21] In accordance with Sea King HAR Mk3 Flight Reference Cards Issue 7 AL9 ANA42.
[22] The method for a double lift with 2 strops is defined in the SARF SOPs Sea King Mk3 & Mk3A Edition 2 Chapter 7 (Exhibit 13). It is designed to enable a casualty to be lifted in a horizontal position. A primary strop is placed over the casualty's head and shoulders and positioned so that it rests under his armpits. A toggle on the strop is then cinched down to secure the strop on the casualty. A secondary strop is threaded around the casualty's legs under his knees. The strops are webbing straps, the ends of which terminate in metal D-rings. These D-rings can be connected either directly to the winch hook or, to make clipping and unclipping quicker and easier, via a SPOAK. The strop-ends are normally held together by the toggle. In order to allow the secondary strop to be threaded around the casualty's legs, however, it is normally 'broken'; that is, one end of the strop is unthreaded from the toggle. In preparation for a double lift with 2 strops, therefore, the primary strop is not broken and connected to the winch hook with the SPOAK; the secondary strop is broken and usually connected to the winch hook with the same SPOAK.

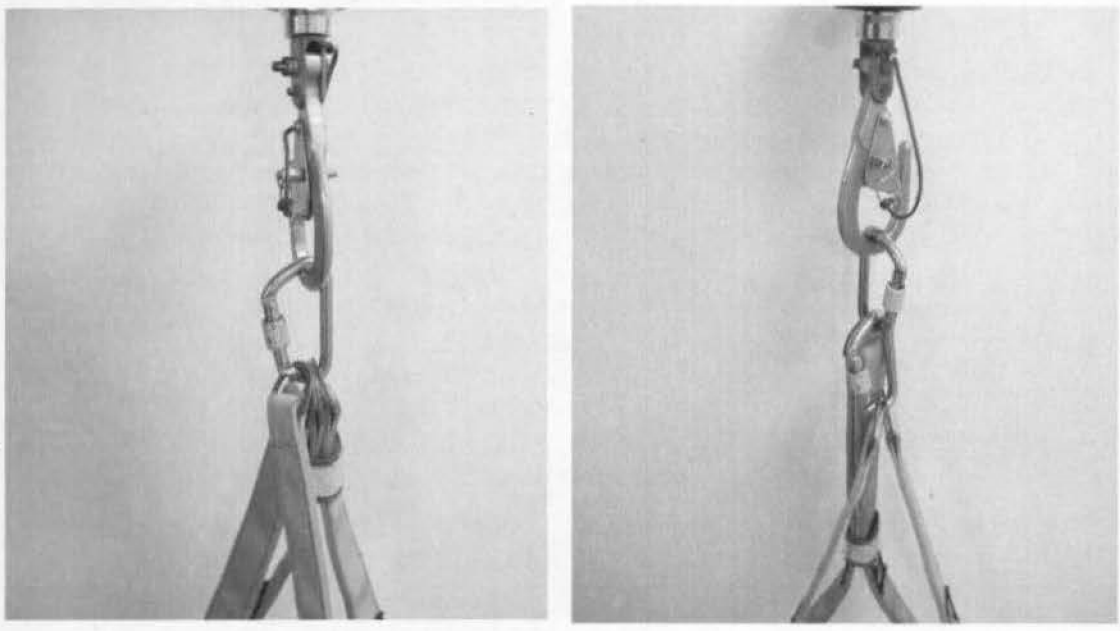

Figure 3 – Strops connected to winch hook with 1 SPOAK (left) and 2 SPOAKs (right)

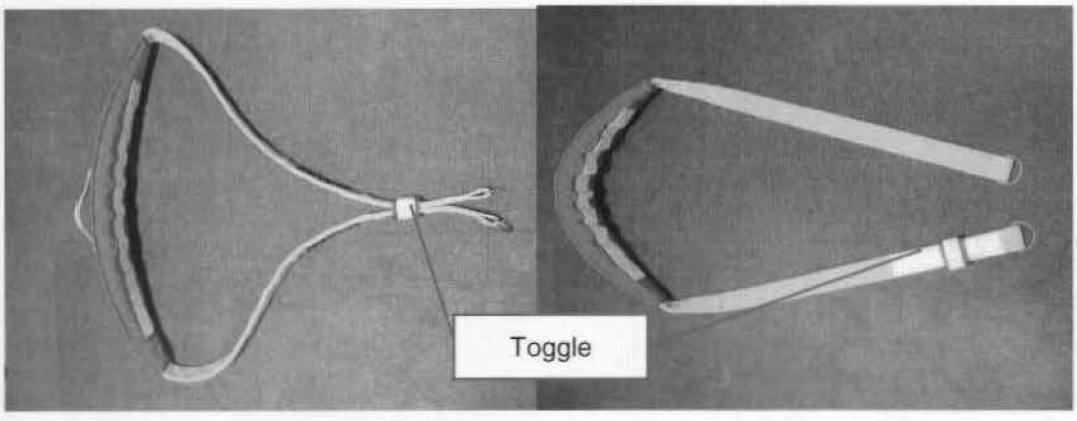

Figure 4 – Primary and Secondary strops, normal (left) and 'broken' (right)

19. The Winchman arrived in the vicinity of the 2nd Climber at about 1359. He estimated that he was on approximately 150 ft of cable and 10 to 15 ft horizontally from the 2nd Climber. He tried to mime rope cutting to the 2nd Climber but elicited no response as communication was hampered due to noise, downdraft and spindrift[23]. E2, E35, W2, W3,

[23] An assessment supported by the 2nd Climber who stated that he had no effective dialogue or signal contact with Winchman at this point as he was forced to crouch into the rock face.

The Winchman cut short his attempt to gain information from the 2nd Climber because he was conscious of the time, estimating that he had already used 3 of the 20 min available. He was also concerned about getting caught in the ropes stretching from the 2nd Climber to the Casualty and had noticed that his cable was touching the rock face above him. He therefore used hand signals to indicate to the RadOp to move him to the Casualty. | W4

20. The Winchman arrived at the Casualty at approximately 1400. The Winchman was in a reasonably stable position with the Casualty in front of him at chest height, with his head on the Winchman's left and feet on the right. The Winchman immediately judged the Casualty to be in a critical condition with what appeared to be a fractured left leg, a severe cranial injury and blood visible on the ice just below the Casualty's head. The Casualty's eyes were open. Given his condition, the Winchman decided that immediate rescue was required. However, he noted what appeared to him to be an extremely complex network of ropes extending above and below the Casualty, including: a yellow rope running from the 2nd Climber, behind the Casualty's shoulders and off up to a point unseen; up to 3 blue ropes stretching up from the Casualty's waist area to points unseen; a blue rope running over the Casualty's waist apparently pinning him to the hillside; and a blue rope draped in a loop below the Casualty which appeared to originate in the area of the Casualty's feet. With the exception of the latter, all the ropes appeared to him to be under tension. | E35, E63, E66, W2

21. In order to fit the 2 strops to the Casualty the Winchman decided to first remove the Casualty's rucksack. The Casualty tried to move his arm to get it off but couldn't. The Winchman was also unable to remove it using the shoulder straps so he decided to cut it free utilising his J-knife. He cut 2 rucksack straps but the rucksack did not fall so he pushed it out of the way. As he cut the straps he noticed some metal climbing gear, possibly karabiners, fall away down the hill. He then disconnected the strops from the winch hook and successfully positioned the primary strop over the Casualty's head and shoulders and down into position; partially assisted by the Casualty who attempted to sit up. Seeing the primary strop in position, the RadOp called that the Casualty was secure to the pilots[24]. The Winchman then threaded the secondary strop around the Casualty's knees. Estimating that it would take a number of minutes to sequentially cut the ropes, the Winchman decided not to connect the strops to the winch hook at this point; aware as he was of an incident in 1998 during which a Winchman had been badly injured when the helicopter was obliged to complete a flyaway while attached to a casualty who was still roped to a cliff face[25]. Content that the 2nd Climber was securely attached to the rock face by a lanyard, the Winchman decided to simplify the rope situation prior to connecting the strops to the winch hook; thereby minimising the risk in the event of a flyaway. Faced with what appeared to be 5 ropes all under tension (one yellow and 4 blue), the Winchman planned to: cut the furthest left rope (yellow)[26]; connect the strops to the winch hook; then cut all of the blue ropes having sought permission each time from the 2nd Climber. | E3, E35, E36, E48, E63, E66, W2, W3

22. The Winchman reached down and took out his J-knife. He took hold of the yellow rope at the Casualty's shoulders and, looking at the 2nd Climber, mimed the | E35, E36, E37, E38,

---

[24] Noting that from his position he was unable to see that the strops were not attached to the winch hook at this point.
[25] Personal Injury Accident Report for Sea King XZ589 dated 31 Aug 98 (Exhibit 3).
[26] Given that the rope ran behind the Casualty's shoulders and continued down to the lower climber, the Winchman considered that it was not supporting the Casualty but was more likely to be an abseil rope for the 2nd Climber.

action of cutting the rope while shouting to ask permission to cut. Unable to hear the Winchman due to the noise of the helicopter, the 2nd Climber assumed that he was being asked to confirm that he was secure before any ropes were cut. Accordingly, he gave a thumbs-up to indicate that he was safe[27]; a response the Winchman did not recall seeing. However, having received what he considered to be a nod of approval he believed he had been given clearance to cut the yellow rope by the 2nd Climber, which he proceed to do. The tension went immediately from the yellow rope and the Casualty fell. The Winchman attempted to grab the strop but was unable to; the Casualty slid down the snow pack, over several ledges and came to rest several hundred feet below. | W2, W4

Post-incident events

23. **2nd Climber.** Once over his initial shock, the 2nd Climber called the Police to update them. He stated that the Casualty had been dropped by the helicopter[28]. He was advised to wait for a call from the MRT. The MRT then called and initially told him that they would arrive shortly with Rescue 137 and then called a second time to let him know that they would be delayed by an hour. Having discussed the options available the 2nd Climber elected to make his own way down to safe ground. On his way down he recovered several items of the Casualty's equipment, including a walking pole, his rucksack and a bandolier of climbing gear. He arrived in the vicinity of the Casualty's body, where he was met by the MRT. In due course he was collected by a Royal Navy (RN) Sea King (Rescue 177) which took him to the MRT base and thence to Fort William Police station. Once there, he handed the Casualty's equipment to the Police and gave a statement to them | W4

24. **Rescue 137.** When the Casualty fell the RadOp reported on intercom that the Casualty had fallen. The Co-pilot noted the time (1408) and saw the Casualty fall below the left side of the ac. The RadOp brought the Winchman back up to the helicopter. The Winchman was in a state of shock and, once on intercom, stated repeatedly that he had only cut one rope. The Captain instructed the Co-pilot to keep his eyes on the Casualty and began a descending left-hand turn. He handed control of the ac to the Co-pilot, who flew the helicopter down to the Casualty's position so that it could be marked on the ac's navigation equipment and his condition assessed. The crew concluded that the Casualty had not survived the fall and elected to fly to Lochaber base. The Captain instructed that the Winchman was not to be winched anymore. | E15, W1, W3, W5

25. During the transit the crew called the ARCC (1413) telling them that they were 2 mins out from Lochaber Base and that they would telephone once on the ground. The crew landed on at Lochaber Base, shut down and the Winchman was dropped off. The RadOp spoke to Lochaber MRT Leader and told him that the crew planned to refuel at Torlundy before returning to pick up the MRT and recover the Casualty. The Winchman would be left at Lochaber Base. The crew called the ARCC on start-up and were instructed (1435) to refuel at Torlundy then return to Lochaber Base. The 3 crew then flew to Torlundy to refuel. Following consultation with OC 202 Sqn, the decision was taken by the ARCC to standown Rescue 137 and to task Rescue 177 with the recovery of the Casualty and 2nd Climber. The crew recovered to Lochaber | E9, E44, E61, E63, W2, W12, W13,

[27] He also assumed that the Winchman had secured the Casualty.
[28] He later corrected this statement as he realised that it was not accurate.

Base, shut down the ac and conducted a debrief as a crew before briefing OC 202 Sqn and the SARF Commander on the incident via telephone. They were then interviewed by the Police before flying the helicopter back to RAF Lossiemouth, landing at 2242. They conducted another debrief at 2300 with OC 202 Sqn and other Sqn members before going off duty.

Recovery of the casualty

26. At 1447 the ARCC tasked Rescue 177 from Prestwick to recover the Casualty. Rescue 177's initial intention was to deploy the winchman at the Casualty's position and then to pick up the MRT for the recovery, but at 1538 a request from the Police was relayed by the ARCC to collect the MRT first. The helicopter flew from Prestwick to Torlundy and picked up 2 members of the MRT. The helicopter then flew to the Casualty; on the way the crew saw the 2nd Climber, still on his way down the hillside. It was not possible to land where the Casualty was so at 1609 the RN Winchman was lowered on the winch, followed by the 2 MRT members. The winchman, a qualified paramedic, immediately assessed the Casualty to be dead. The trio completed a photographic survey of the site. The helicopter returned to Torlundy to collect more MRT personnel. The helicopter then found a place to land and ferried 2 further groups of 3 MRT members to the Casualty's position. At about this time the 2nd Climber arrived at the scene and was met by one of the MRT members. He was escorted to the helicopter and flown down to Torlundy. The Casualty was placed in a stretcher, loaded onto the helicopter and recovered to Torlundy where he was pronounced formally dead at 1725 by a physician from the Belford Hospital. E32, E42, E44, E46, E61

Command chain actions

27. At the time of the incident the SARF Commander, OC 202 Sqn and OC D Flt were in a teleconference together; the SARF Commander and OC 202 Sqn at RAF Valley in Anglesey and OC D Flt at RAF Lossiemouth. At approximately 1425, OC D Flt was called out of the conference to take a call from the Captain of Rescue 137, who informed him that the incident had occurred and gave him brief details. At the same time the SARF Media and Communications Officer at RAF Valley was informed by the ARCC; he immediately informed the SARF Commander and OC 202 Sqn. The SARF Commander gave the lead on the incident to OC 202 Sqn, with the priority being the crew's welfare followed by maintenance of SAR operational capability. E40, E61, W6, W13

28. At 1435, OC 202 Sqn and the SARF Chief of Staff contacted the ARCC for an update. OC 202 Sqn requested that the Captain call [redacted] once on the ground at Torlundy. The ARCC proposed scrambling Rescue 177 to recover the Casualty; a course of action supported by OC 202 Sqn given the likely mental state of the crew and the fact that they would be operating without a Winchman. This message was passed to Rescue 137 at 1441. At 1445 the Police called the ARCC to ascertain the intentions for Rescue 137 and to request interviews with the crew once they returned to Lochaber Base. At 1447 the ARCC scrambled Rescue 177, tasking the crew to recover the Casualty and 2nd Climber and to take imagery to aid the ensuing investigation. E61, W13

29. In parallel with this activity, at RAF Lossiemouth, OC D Flt ordered the Operations (Ops) Clerk to work through the D Flt Crash Orders. The Ops Clerk carried out the checklists and his actions were double-checked by the off-duty Ops Clerk, who had come in on unrelated business. OC 202 Sqn called to confirm that OC W6

D Flt was completing the response plans and impounding items as required for the ensuing investigations.

30. OC D Flt then progressed several threads in parallel: E61, W6, W13

a. **Engineering.** He consulted the civilian Engineering Manager to consider impounding the ac's electronic Form 700[29]. He was keen to balance continuing to maintain the ac on-state for SAR against the need to impound. At this stage he could see nothing to indicate any ac-related failure and the fact that the Winchman was alive served to reinforce this; winch or cable failure could be excluded. Recovering the electronic Form 700 once impounded would take a significant time and affect operations once the incident was over. He thus took the decision not to impound the Form 700. Failure of the strops could not be ruled out, however, so documentation relating to them was impounded.

b. **Personnel.** He informed the RAF Lossiemouth Acting Station Commander, who came to D Flt. They considered involving Personnel Services Flt from Lossiemouth but, since no military fatalities or injuries had occurred, it was decided that there was no need.

c. **Current SAR state.** Since the Flt was now unable to conduct further SAROPs, he considered bringing the next crew in early. Noting the ensuing impact on the ability to maintain on-state for the coming shifts he decided not to do this and declared the Flt off-state to the ARCC. The impact to the Tornado fleet at RAF Lossiemouth was managed through engagement with the Acting Station Commander.

d. **Rescue 137 crew welfare.** It was the preference of the crew to fly back to RAF Lossiemouth. However, OC D Flt considered the balance of the relative welfare of returning home against staying away in an hotel; mindful that the crew may not be in a fit state to fly home once the Police had completed their immediate investigations. He therefore dispatched the Ops Clerk to Fort William in the Sqn minibus to give the option of driving the crew home should it be required.

e. **Recovery of the ac.** Aware that the Procurator-Fiscal may decide to impound the ac, he wanted to ensure that the Police understand the implications such an action would have on the provision of SAR cover; a point he emphasised via the ARCC[30]. Assuming the ac would eventually be released, he discussed its recovery with the Engineering Manager. Arrangements were made to send groundcrew to Lochaber Base the following day to carry out the relevant servicing for flight and to trip the Circuit-Breaker (CB) for the Cockpit Voice and Flight Data Recorder (CVFDR) to preserve the recorded information on it. He also discussed the ac's release with OC 202 Sqn who told him that if the ac was released that evening, and he judged the crew fit to fly, then [redacted] was content for him to authorise the crew to fly back to base. At around 1530, OC

[29] The Form 700 is the RAF engineering document that records all maintenance activity that is carried out on the ac. It would normally be impounded in the event of an ac accident.
[30] At 1523 the ARCC briefed the Police Area Commander that: the RAF understood the Police had primacy; that it was natural for the Winchman to want to speak to the crew before the Police; to request that the Police respect the emotional condition of the crew; and that the ac would remain at Lochaber where the crew would be released for interview. The Police Area Commander in turn briefed the Procurator-Fiscal's intention to impound the ac at which point the ARCC covered the associated penalty with regard to SAR cover.

202 Sqn set off from RAF Valley to Fort William to meet the crew.

31. At 1909 the Rescue 137 helicopter was released by the Procurator-Fiscal and Police. OC D Flt was informed by the ARCC at 1913, with a follow-up call to him by the ARCC to request intentions at 1924. At 1930, OC D Flt was informed that the Winchman had still not been interviewed. Given that up until that point interviews had been taking over 3 hr to complete, he decided to book hotel accommodation for the crew in Fort William. At 1943 he informed the ARCC of his plan to leave the crew at Fort William. Accordingly the Ops Clerk was instructed to collect OC 202 Sqn from Inverness airport and take [redacted] to Fort William. He also called the crew and told them the plan; emphasising the need to look after the Winchman. E61, W6

32. Shortly thereafter, OC D Flt received a call from the Co-pilot to say that the Winchman was likely to be out of interview soon, and that the crew preferred to return to RAF Lossiemouth. OC D Flt was keen to recover both ac and crew[31] and set a deadline of 2230 for recovery to base; provided the Winchman was judged to be fit-to-fly by the Captain. Having received assurances that all of the crew were fit and able to fly home, he authorised the sortie and texted OC 202 Sqn to divert [redacted] from Fort William to RAF Lossiemouth. However, despite having been reminded by OC 202 Sqn earlier, he forgot to remind the crew to trip the CB for the CVFDR[32]. The helicopter took off from Lochaber at approximately 2200. E61, W6

33. OC 202 Sqn arrived at RAF Lossiemouth at around 2230. [redacted] and OC D Flt discussed the crew's Trauma Risk Management (TRiM) and pastoral care. The crew landed at 2242. They met for a debrief with OC 202 Sqn, OC D Flt and FS [redacted][33]. The debrief lasted 20-30 mins and OC 202 Sqn took notes. The crew was then sent home, with the Winchman driven home by OC D Flt, whilst OC 202 Sqn updated the SARF Commander. E9, W6, W13

[31] Judging that it would be best for crew welfare and the most expeditious course of action with regard to returning the Flt to SAR duty.
[32] He had planned to check regulations governing flight without a CVFDR ready for a return flight the following morning.
[33] Although not a TRiM practitioner was asked to attend due to his experience as a Samaritan and Winchman.

PART 1.4 FINDINGS

Available evidence

1. The following evidence was available to the Panel:

   a. Statements to the Panel from the crew of Rescue 137.

   b. Statements to the Panel from the 2nd Climber.

   c. Statements to the Panel from associated organisations; the ARCC and the Lochaber MRT.

   d. Statements to the Panel from expert witnesses including: the SAR Standards and Evaluation (STANEVAL) Winchman; the 203(R) Sqn Rearcrew Training Officer (RTO); the 202 Sqn Winchman Training Officer (WTO); the 202 Sqn WTO; and the Bristow Ltd WTO.

   e. Statements to the Panel from the 202 Sqn hierarchy.

   f. Statements given to Police Scotland[1] by the crew and various other witnesses.

   g. A video recording from the Forward-Looking Infra-Red (FLIR) camera[2], which included the crew intercom and radios (but not the 'Airwave' radio[3]).

   h. Photographs provided by the 2nd Climber, 2 of which were taken by the Free Climber.

   i. A photograph taken by a climber on 3 Mar 13 (8 days after the accident).

   j. Photographs of the Casualty after the accident provided by Police Scotland.

   k. Equipment recovered from the Casualty and scene, including his crampons, harness, the ropes, his rucksack and the Winchman's J-knife.

   l. A Police forensic analysis of the blue and yellow ropes, J-knife and rucksack.

   m. Notes taken by various personnel on the day.

   n. Associated documents, including: D Flt, 202 Sqn supervisory documents; flying logs, training records and records of service for the crew; technical documentation for the ac and equipment; and SARF SOPs and Orders.

2. The list of available evidence is long; much of it, however, is peripheral. The accident occurred when the yellow climbing rope was cut. There is no direct recording of this event. Accordingly, when considering inconsistencies of evidence, the Panel placed the most weight on physical evidence, on the FLIR tape recording, on photographic evidence and on the witness statements taken closest to the time of the accident.

---

[1] Northern Constabulary was absorbed into Police Scotland with effect from 1 Apr 13.
[2] The Sea King HAR Mk3 is fitted with the STAR Q Multi-Sensor System, referred to as 'the FLIR'. The system provides an Infra-Rad (IR) thermal-imaging sensor, a daylight TV camera and the facility to record IR or TV images onto digital tape. The tape lasts approximately 3 hr and must be set to record by the crew.
[3] The 'Airwave' radio is not recorded on the FLIR video soundtrack unless the intercom is selected to ALL (which was not the case for this flight).

Services

3. The Panel was assisted throughout by Police Scotland. The services of the following personnel and agencies were also made available:

a. Human Factors (HF) experts from the RAF Centre of Aviation Medicine (CAM).

b. Photographic Section, RAF Lossiemouth.

c. A Military Air Accident Investigation Branch (MilAAIB) Advisor.

d. An Image Analyst from the Defence Geospatial Information Fusion Centre, Joint Forces Intelligence Group (JFIG).

e. Environmental & Industrial Hazards Support Group from the Institute of Naval Medicine.

The ac and equipment

4. The Panel was able to rule out ac and equipment failures as accident causes, noting that at no point was the Casualty connected to the ac. The crew did not report any ac failures and an examination of the ac servicing records confirmed that there were no ac engineering faults that would have affected the accident. The Panel also examined the strops used by the Winchman, along with their servicing records and found them to have been fully serviceable. The Panel concluded that the ac and associated role equipment were not a factor in the accident. W2, E31, E50

Crew authorisation, supervision, regulation, training and qualification

5. The Panel found that the crew was properly authorised, current and constituted in accordance with RAF SARF Orders Edition 3 Change 2 Amendment 15 (dated 6 Sep 12) and that all crew members were acting in the course of their duties. Equally, the Panel found that D Flt supervisory practices and processes were satisfactory and compliant with extant SARF Orders. The Panel found no evidence that the crew did not comply with the relevant orders and regulations; moreover, the Panel established that the crew was properly trained and qualified although minor observations on the Winchman's training and selection are covered in paras 55 and 61. The Panel concluded that authorisation, supervision, regulation, training and qualification were not factors in the accident. E4, E5, E6, E7, W6

Crew planning and preparation

6. SAR operations are necessarily reactive. In order to address this, currencies in multiple disciplines are specified in SARF Orders, whilst SARF SOPs lay out a structured approach to reactive tasking. The Panel noted that this highly-experienced crew did not follow the SOPs rigidly, but concluded that their planning and preparation was not a factor in the accident. E2, E51

Weather conditions

7. The Panel was able to determine the weather conditions on-scene using data provided by the Meteorological Office at RAF Lossiemouth. The data shows a system of high pressure over the area with a regional pressure setting of 1032 hPa. Winds were variable at 4 kts at the surface, 090°/5 kts at 2000 ft and 095°/8 kts at 5000 ft. The temperature was +6°C at sea level with the freezing level forecast to be at 3000 ft. Visibility was 20 km. Overall weather conditions were excellent for the conduct of SAROPs E74

with very stable air and little or no turbulence; thereby enabling the pilot to maintain a very accurate and stable hover during the rescue. The Panel concluded that the weather conditions were not a factor in the accident.

The rope system and rescue attempt

8. The Panel was presented with a contradiction from the outset; namely a discrepancy between the rope situation as described by the Winchman on arrival with the Casualty[4], and that which would normally be expected to result from a classic leader fall using a dual half-rope belay arrangement. The Panel was keen to understand this apparent complexity in what should have been a simple system. In addition, the Panel noted the failure of the blue rope to support the Casualty once the yellow rope was cut; a failure that should not have occurred given the 2nd Climber's statement that the Casualty was secured by both ropes prior to the arrival of Rescue 137. In order to understand why the rescue attempt failed and to establish the cause, the Panel considered a re-construction of the rope system when the Winchman arrived at the Casualty to be key. W2, W4

Rope system evidence

9. The following evidence pertaining to the rope system was considered by the Panel: E2, E18, E19, E21-26, E35, E36, E37, E38, E53-55, E71, E72, W2, W3, W4, W18

a. Physical lengths of rope sections from the Casualty and 2nd Climber.

b. Photographs taken by a Free Climber prior to the initial fall.

c. Photographs taken by a climber after the accident (3 Mar 13).

d. FLIR video imagery.

e. FLIR stills enhanced by RAF Lossiemouth Photographic Section.

f. Witness statements.

The benefits and limitations of each type of evidence are presented in the following paras.

10. **FLIR imagery.** The relevant FLIR imagery is 1 hr 10 m 35 s long and starts at 1244 on 25 Feb 13 when the crew were first notified of the SAROP tasking[5]. The majority of the imagery covers the termination of the previous training sortie, the refuel at RAF Lossiemouth and the transit to Ben Nevis. Of note, the Sea King HAR Mk3 FLIR camera can be slewed in pitch and azimuth, controlled by the RadOp from the Radar console in the cabin; these controls are not within reach when the RadOp is at the winch operating position. As a result, the FLIR camera was fixed at a position that was estimated by the RadOp as being the best to capture the rescue scene before he moved to operate the winch. Consequently, the FLIR camera only captured the incident scene for a 2 m period as the helicopter moved into position. The Casualty and 2nd Climber first come into full view at approximately 1 hr 07 m 4 s on the FLIR video and the scene disappears from view at approximately 1 hr 09 m. The FLIR imagery ends at 1 hr 10 m 25 s, going fully black for the final 10 s. E2, W3

[4] For example, the Winchman described a rope system containing only one yellow rope; which did not, to him, appear to be attached to the Casualty.
[5] The FLIR imagery was presented to the Panel on 2 separate DVDs. Only the second DVD contains information that is directly relevant to the Service Inquiry (SI); the first DVD contains footage of the training sortie. It is only the time and duration of the second DVD that is quoted here. The full FLIR video tape is 3 hr long.

11. **FLIR resolution.** The low resolution of the FLIR imagery makes definitive identification of the ropes very difficult; a situation that was exacerbated due to areas of partial obscuration caused by debris on the camera lens. When viewed as still images, the FLIR recording shows the major strands of climbing rope clearly; albeit intermittently. When the imagery is watched as video, the movement of the ropes in the rotor downdraught makes them easier to see; moreover, following still imagery enhancement the colours between the 2 rope systems can occasionally be distinguished. However, neither still nor video imagery from the FLIR shows with any clarity the position of the ropes within the close vicinity of the Casualty. E2, E21-2

12. **FLIR imagery analysis.** Imagery analysis by JFIG produced estimates[6] of the visible rope lengths (Figure 5) as follows: Annex A

a. Loop of rope hanging below the 2nd Climber; 36 m minimum length.

b. Rope between 2nd Climber and an apparent pivot point (approximately 2 m above and right of the Casualty); 13 m ± 2 m.

c. Rope between 2nd Climber and Casualty's head; 11 m ± 2 m.

Annex A

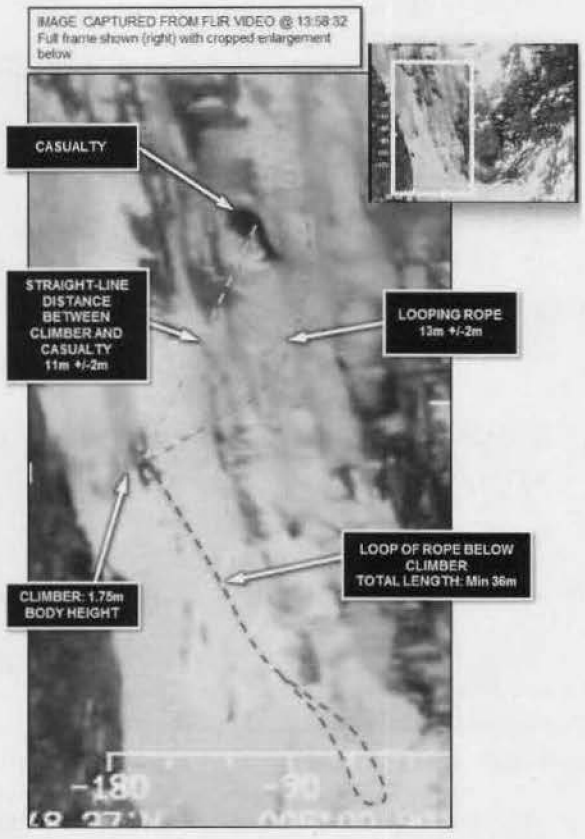

Figure 5 – Rope lengths as determined by JFIG Analysis

13. **Witness photographs.** Photographs were taken very shortly before the initial fall by a Free Climber. A further photograph was taken of the scene by another, different climber on 3 Mar 13. These photographs provide key information about the initial configuration of E18, E19, E71

[6] Noting that there is a significant foreshortening effect due to the angle of the FLIR camera which it is not possible to correct for. Inaccuracies have therefore been estimated by JFIG. The foreshortening has a particular effect on the loop of rope below the 2nd Climber. This means that the loop measures at least 36 m; the foreshortening effect, if corrected, would only make the loop longer.

the yellow and blue ropes as well as the ice-screws, anchors and runners around the Casualty's final position.

14. **The ropes.** The yellow and blue ropes were both recovered from the scene and found to be severed; each was thus in 2 lengths. A yellow and a blue half were found attached to the Casualty's harness. The other halves were initially attached to the 2nd Climber's harness. The ropes were measured as follows: E53, E54, E55

a. **Casualty ropes.** The blue and yellow rope halves attached to the Casualty's harness[7] were measured by the Police without untying the knots. The yellow rope length was 31.2 m and the blue rope length was 13 m.

b. **2nd Climber ropes.** The 2nd Climber used the other lengths of the blue and yellow rope to abseil with and handed them over to Lochaber MRT members, who in turn handed them to the Police. The rope lengths were measured by the Police but all knots had been untied by the 2nd Climber. The yellow rope length was 22.8 m and the blue rope length was 44.5 m.

c. **Total rope lengths.** The combined total lengths were 54 m for the yellow rope and 57.5 m for the blue rope. The 2nd Climber described both ropes as being 60 m, but the Panel accepted this anomaly on the following grounds:

i. Sixty m is a standard description for shop-bought ropes and actual length may well have slight variance even when new.

ii. The ropes attached to the Casualty had a certain amount used in the tying-in loop and knot that were not part of the measured length; this would normally be approximately 1.5 m.

iii. As ropes get older it is generally accepted that they can shrink by a small amount (up to 10% in some cases).

The Panel concluded that although the 2 separate parts of the both the yellow and blue ropes did not total 60 m, they were within acceptable norms and hence the likelihood of any missing sections could be discounted.

15. **Witness statements.** Various witness statements describe elements of the rope systems; however, the witnesses' expertise and viewing angles vary, as do their descriptions. The 2nd Climber's statements were allowed more weight than those of the crew due to his relative expertise in using climbing rope systems. As would be expected, given the dynamic nature of the incident, there were slight differences between statements taken from the same witness during initial and subsequent interviews; earlier statements were therefore given more credence. That said, the contradictory nature of the evidence contained within the witnesses' statements made absolute definition of the rope systems impossible to verify from their contents alone. E33, E35, E36, E37, E38, W2, W3, W4, W18

Integrity of the rope system

16. The 2nd Climber stated that: the Casualty was secured by both the yellow rope and the blue rope; that he was holding almost all of the Casualty's weight on the yellow rope; that he had taken in the slack on the blue rope such that he was holding some tension on it; and that this had not changed when he moved his belay point to lower the Casualty. The W2, W4, E37, E38, E47, E 83

[7] Attached by a 'bowline and half a double fisherman stopper' knot. The configuration of the knots was standard for a dual half-rope climbing system.

Winchman stated that all of the ropes appeared to him to be under tension bar one stretching below the Casualty. From these statements, the Panel concluded that both the blue and yellow ropes were intact before the arrival of the Winchman. Consequently, when the yellow rope was cut by the Winchman, the Casualty should have fallen a short distance onto the blue rope. Initial examination by the Panel showed that the blue rope had also been severed. Accordingly, the Panel requested a forensic analysis of the blue rope by Police Scotland to determine the means by which this had occurred; the results of which are discussed at para 32.

Rope system reconstruction

17. The Panel reconstructed the rope system by considering its condition at 3 stages:

a. Before the Casualty's initial fall.

b. After the Casualty's initial fall.

c. The individual yellow and blue systems when the Winchman arrived on-scene.

18. **The accident pitch.** As described in Part 1.3, the climbers were using a dual half-rope system. The 2nd Climber had set himself up in a belay position at the base of the pitch. The Casualty climbed above him, occasionally placing ice-screws and other anchors as he went to provide security in the event of a fall. The route up the pitch traverses under 2 narrow 'ribs' of rock with a small gully in-between. It then enters a larger gully between a left-hand rib and a long descending ledge on the right, referred to by the Panel as a gangway. The gully is approximately 2-3 m deep and it is understood that the Casualty climbed out of the gully up an ice ramp on the right-hand side[8] shortly before he fell. The left-hand rib and gangway both have large rock blocks in them, which ascend in steps (see Figure 6)[9]. E2, E16, E17, E72, W4, W18

19. **Rope system before the Casualty's initial fall.** For ease of reference, the Panel adopted a numbering system for the anchors, illustrated in Figure 6. The anchors have been referred to as 'runners'[10] and numbered in the order in which the Casualty would have placed them as he climbed. The positions of Runners 2, 3 and 4[11] are clear through photographic evidence. The position of Runner 1 was noted by a climber on 1 Mar 13 when he retrieved it from the ice and later plotted by him on a photograph of the pitch for the Panel. Other elements of the rope system were deduced by the Panel as follows: E2, E18, E19, E71, E72, W4, W18

a. The 2nd Climber stated that the blue rope ran up the right side of the gully and the yellow rope ran up the left; this is supported by photographs taken before the incident (Figure 7). He also stated that the Casualty was particularly careful not to cross the ropes over. The Panel assumed, therefore, that the ropes continued to run yellow left, blue right. This would be consistent with both testimony and good climbing practice.

b. The FLIR imagery shows 2 ropes stretching up well above the Casualty on the left side of the gully. From both witness and photographic evidence, the Panel deduced (para 24) these to be the yellow rope running up from the Casualty, through an anchor and back down to the 2nd Climber. From this, the Panel inferred the

[8] Based on opinion of a climber who saw tracks that he believed belonged to the Casualty on 1 Mar 13.
[9] It should be noted that the photograph gives a false illusion of the slope; the pitch is at an average of 70-85° from the horizontal. This angle is more obvious from Figure 7. The false perspective in all images, both FLIR and photographic, presents a challenge both when assimilating the relative positions of climbers, anchors and ropes and when estimating distances.
[10] As for most of the anchors this was the device used by the climbers.
[11] Consisting of a sling through an ice column on the right hand side of the gulley.

existence of at least one anchor in the yellow system high in the gully.

c. The tying-in loops and knots of both climbers would have accounted for approximately one to 1.5 m of rope length at each end of both ropes. When the initial fall occurred the 2nd Climber estimates that there was at least 5 m reserve of rope left to pay out from his belay device to the Casualty. This would place the Casualty approximately 45 m higher up the gully than the 2nd Climber.

Figure 8 schematically represents the most likely rope system prior to the Casualty's initial fall.

E72

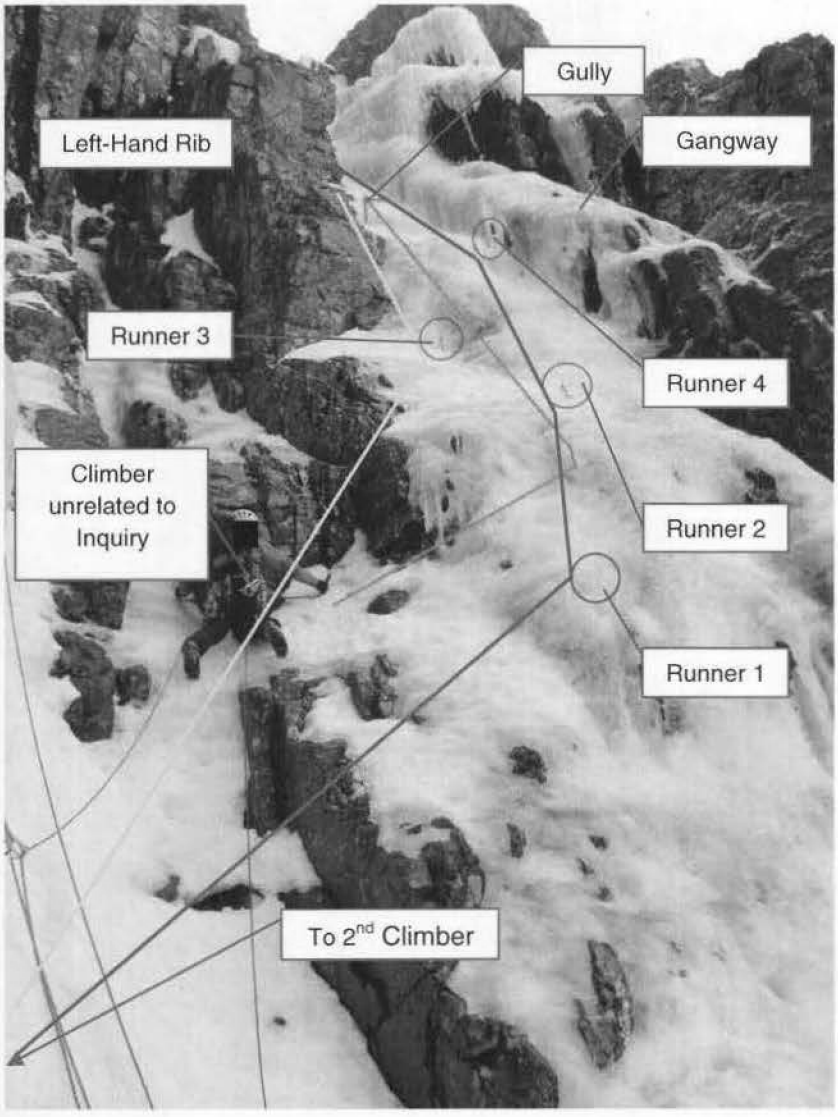

Figure 6 – Accident pitch with ropes superimposed

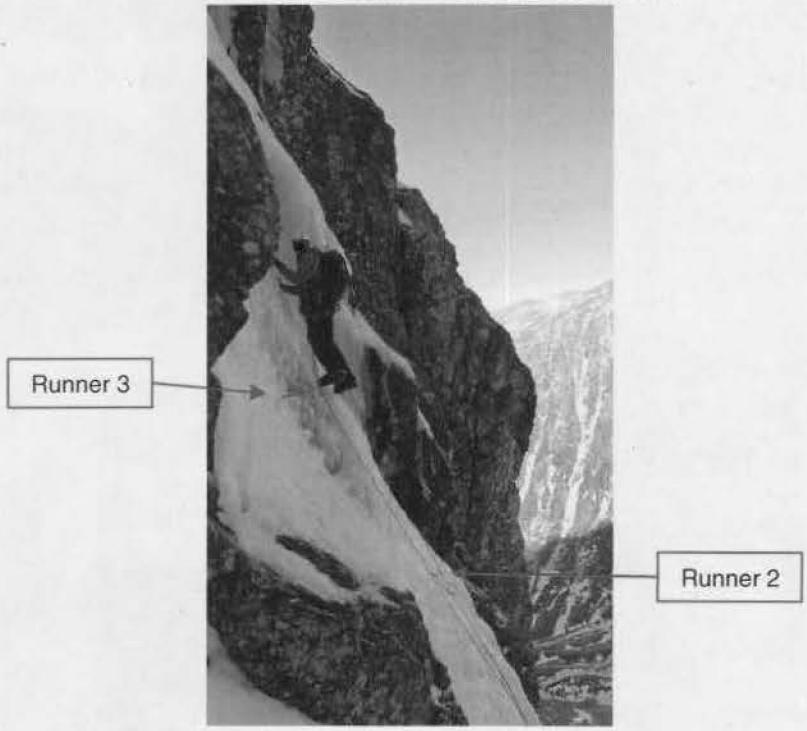

Figure 7 – Accident pitch showing slope

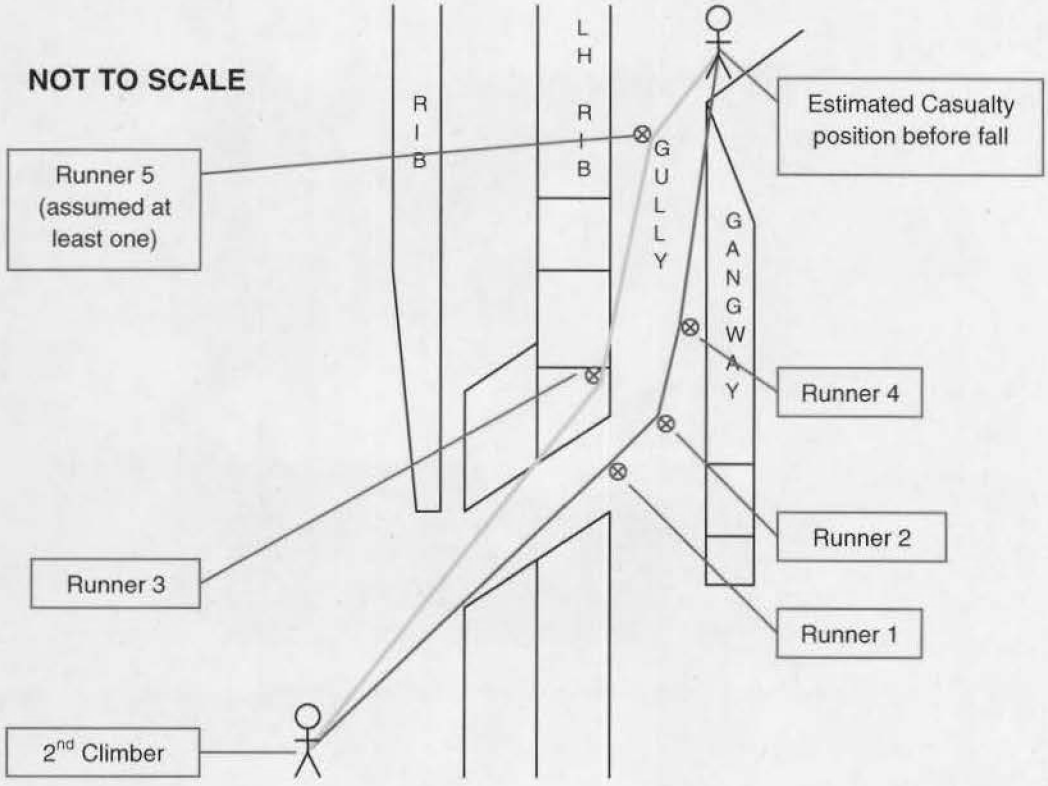

Figure 8 – Rope system before Casualty's initial fall

20. **The initial fall.** There were no eye-witnesses to the Casualty's initial fall and therefore only deductions can be made about possible events during the fall. It is likely that, at the point of the fall, the Casualty had exited the right-hand side near the top of the gully on an ice ramp. The 2nd Climber describes the Casualty hitting the left-hand rib as he came into view. The Panel deduced that the Casualty fell backwards from the right of the gully before hitting the left-hand rib then falling down the rib and gully; this fall line would have taken him clear of the blue rope anchors[12]. The 2nd Climber successfully held the fall and immediately noticed most of the weight was held on the yellow rope. He stated that he had arrested the fall on the yellow rope; from which the Panel deduced that a yellow rope system anchor must have held higher up the cliff face than any within the blue rope system. W4

21. **Casualty's position after the initial fall.** In deducing where the Casualty came to rest at the end of the fall, the Panel considered a statement by the Winchman that the Casualty's rucksack appeared to be attached to a karabiner and this prevented him from attaching it to his Grabbitt hook. Photographic evidence of the Casualty taken before the incident does not show any karabiners attached above the waist strap of the rucksack. Therefore any karabiner in the vicinity of the Casualty's shoulders post his fall must have been part of a runner. Moreover, the Winchman stated that the yellow rope passed behind the Casualty's shoulders. The Panel deduced that what the Winchman had thought to be a karabiner attached to the rucksack was in fact the karabiner for Runner 3; this would be consistent with the path of the yellow rope, the photographic evidence of the runner placement (Figure 6) and witness statements. Given that the 2nd Climber later lowered the Casualty (para 22), the Panel concluded that the Casualty must have come to rest a short distance above Runner 3[13]. W2, W4, E16, E17, E18, E72

22. **Rope system after the initial fall.** In the immediate aftermath of the initial fall, the 2nd Climber stated that he tied off the yellow rope at the belay device. He then took in the slack rope from the blue rope system so that it would act as a back-up to the yellow system. On being asked by the Casualty to lower him, the 2nd Climber moved diagonally upwards and across to a new belay point; without disconnecting from his 120 cm sling. The Panel deduced that, due to the angles involved, the Casualty would have been lowered by no more than a metre. The Panel therefore concluded that the Casualty's final position before the arrival of the Winchman was just below Runner 3 (Figures 9 A & B). This was confirmed by the 2nd Climber, who placed the Casualty as illustrated in Figure 9A. This position is consistent with the FLIR imagery. E2, E37, E38, W2, W4

[12] It is likely that he would have placed more anchors above Runner 5 in order to increase his protection, but if he did these must have been ripped out during the fall. When climbing on ice it is not uncommon, if the initial fall onto the highest ice-screw is severe, for the first few ice-screws to fail whilst absorbing the initial energy of the fall.

[13] This is supported by evidence (E71) from a climber on the gully adjacent to Raeburn's Buttress on 1 Mar 13, who found the Casualty's ice axes at this position.

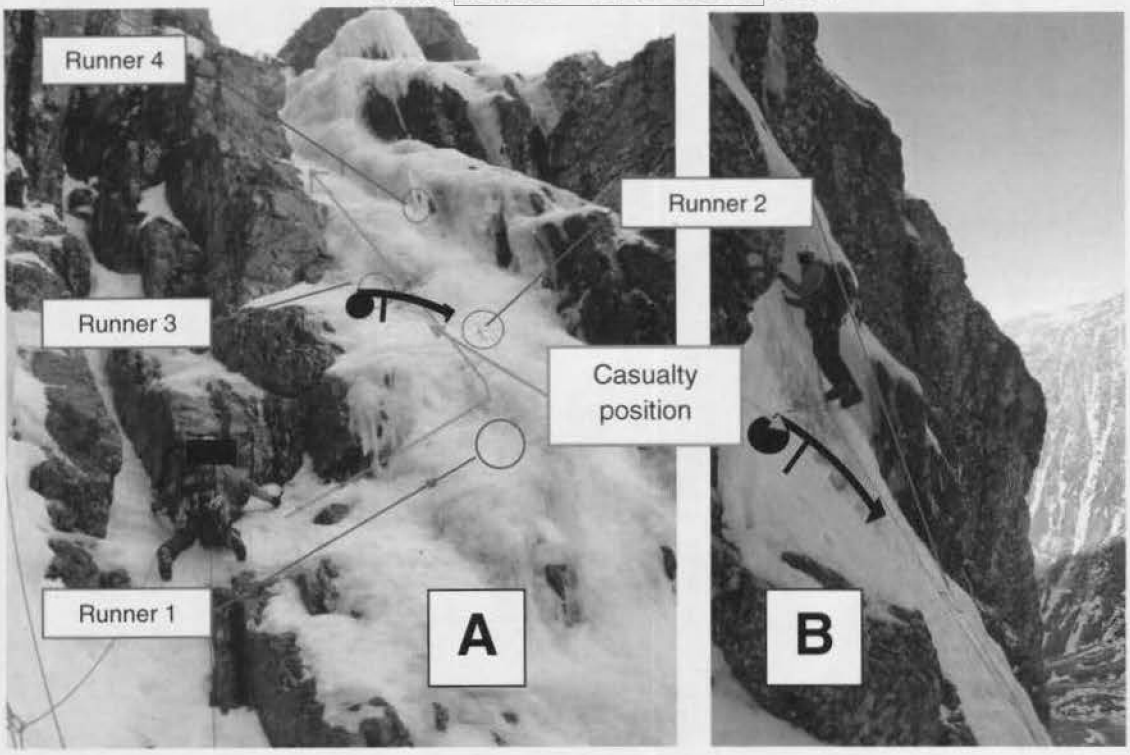

Figure 9 – Estimate of Casualty position on arrival of the Winchman

23. The 2nd Climber stated that after the move to a new belay position was achieved, he was still holding almost all of the Casualty's weight on the yellow rope system. The Panel noted that this was logical; the yellow rope would have been weight-bearing throughout due to being directly counterbalanced by the 2nd Climber. However, the blue rope system now had an amount of slack introduced into it from its previous 'hand-tight' condition due to the 2nd Climber's move. The 2nd Climber did not take in this new slack. This small amount of slack in the blue rope system is visible in the FLIR imagery and is made more visible when the rope is buffeted by the rotor down wash. E2, W4

24. **Yellow rope system on arrival of the Winchman.** The FLIR imagery shows 2 ropes running up from the 2nd Climber to the Casualty. One runs in a direct line to the Casualty's head and shoulder area and does not move at all in the helicopter rotor downdraught; indicating a weight-bearing rope. The Panel concluded that this taut rope was the yellow rope which ran through Runner 3. Further up the slope, 2 parallel strands of rope are visible on the FLIR imagery well above the Casualty (Figure 10); reaching up to a point in excess of 10 m. Given the length of blue rope below the 2nd Climber (minimum 36 m), and the belay system used, the Panel concluded that the only rope long enough to run where the parallel strands are observed on the FLIR video was the yellow rope; with the presumed anchor point (Runner 5) approximately 15 m[14] above the Casualty[15]. Therefore, the Panel considered that the yellow rope system was most likely in the following configuration on the arrival of the Winchman (Figure 11): E2, E18, E19, E25, E26, E53, E54, E5[illegible], W2, W4

a. A one to 1.5 m length used to tie-in the 2nd Climber.

[14] Estimated from the length of measured rope attached to the 2nd Climbers harness and the fact that the Winchman stated that he cut the yellow rope around the area of the Casualty's shoulders.
[15] The Panel considered that the separation between the parallel strands may have been introduced by either Runner 5 actually being 2 anchors, or by a pronounced feature on the cliff such as a small buttress or flake.

b. An approximate 10 m loop of 'reserve' rope, which had not originally been paid out, attached to the 2nd Climber's belay device[16].

c. An approximate 11 m length rope (Strand 1) up to Runner 3 behind where the Casualty's head and shoulders were.

d. An almost vertical length of rope running up the gully for approximately 15 m (Strand 2) from Runner 3 to Runner 5.

e. A 15 m length of rope (Strand 3) counterbalancing on Runner 5 above the Casualty and passing back down to the tying-in point on his harness.

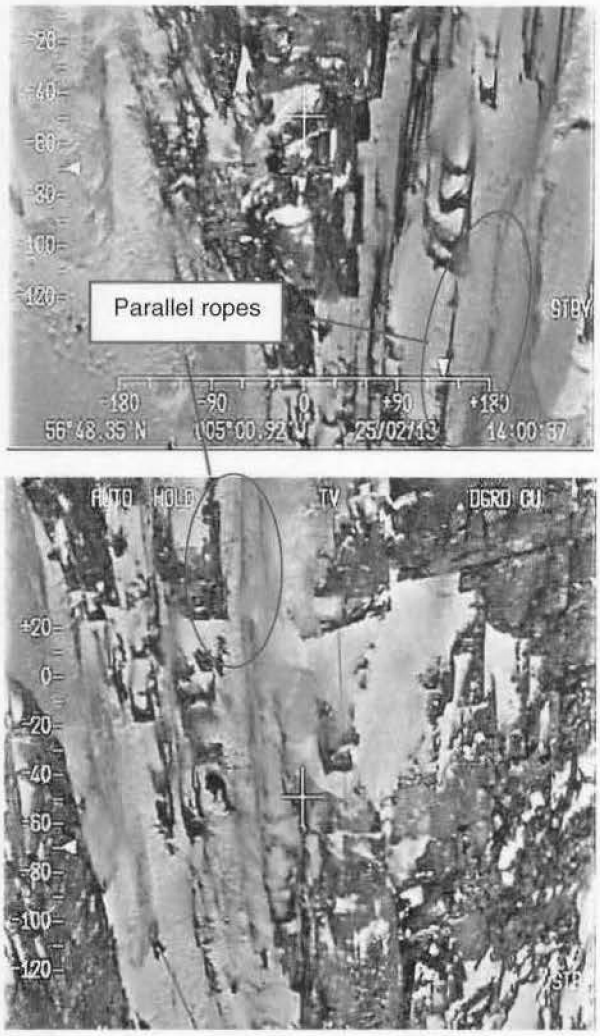

Figure 10 – FLIR image of parallel rope strands above Casualty

[16] The 2nd Climber stated that he gave a standard warning call to the Casualty, before he fell, that there was only 5 m remaining on the yellow rope; this was his best estimate of how much yellow rope he had left to pay out. As stated in Part 1.3, however, he then moved his belay position a few metres, which would have changed the amount of rope remaining. This 'reserve loop', not visible on the FLIR imagery, together with the error margins, could account for the difference between the measured length of yellow rope (54 m) and the length deduced from imagery (52.5 m).

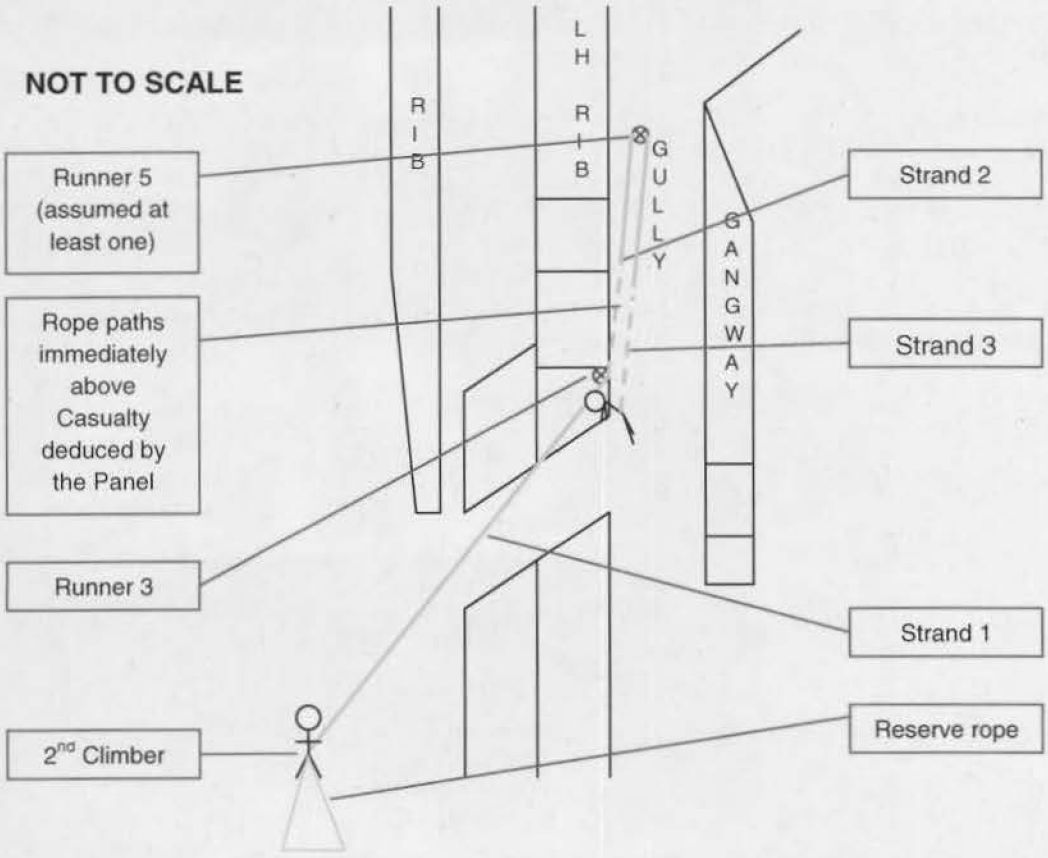

Figure 11 – Yellow rope system on arrival of Winchman

25. **Blue rope system on arrival of the Winchman.** Given the conclusions at para 24, the Panel deduced that the second rope on the FLIR imagery running in an apparent curve from the 2nd Climber past the Casualty to an unseen higher anchor point was the blue rope; an assessment supported by the rope's observed movement which was consistent with approximately one metre of slack having been introduced into the previously hand-tight blue rope system by the horizontal movement of the 2nd Climber (para 23). From photographic evidence the Panel plotted the known anchors onto a still image from the FLIR video using features in the terrain for reference (Figure 12)[17][18]. Given the proximity of the blue rope and the plotted anchor points the Panel concluded that the blue rope ran from the 2nd Climber and through Runners 1, 2 and 4[19]. E2, E18, E19, E25, E72, E73, W4, W18

[17] Given the differences in perspective, the positions are approximate and are shown as ellipses to indicate the estimated potential error.
[18] The Panel observed a straight line on the FLIR image (Figure 12) that runs straight across the gully to the Casualty. The Panel at first took this to be a rope but when the image is magnified it appears to be a series of rocks or other terrain features. The view that it is not a rope is supported by the fact that it appears to bend through almost 90° just above the Casualty and also on the gully wall, when there are no features or anchors in those areas that would cause a rope to lay in that way. The Panel concluded that it was not a rope and it is labelled 'false rope' on Figure 12.
[19] It should be noted that all the runners had slings on them, mostly 20 cm long, which meant that the rope did not run over the anchor points but was able to pivot around the area of each anchor.

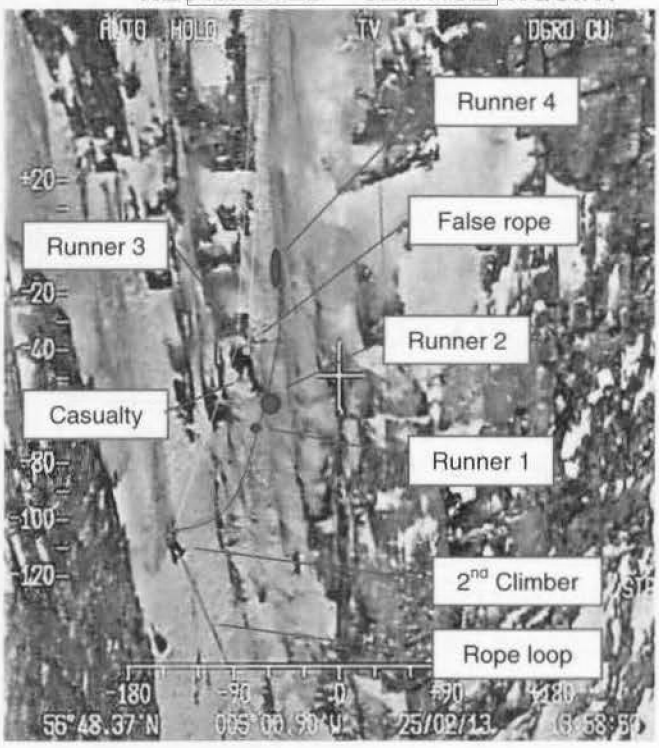

Figure 12 – FLIR image with plotted anchor points

26. **Blue rope loop.** The FLIR imagery shows a large loop of rope running below the 2nd Climber and being buffeted by the rotor downwash (clearly visible as a dark line below the 2nd Climber on Figure 12). Since the 2nd Climber did not report taking in any slack from the yellow system, the Panel concluded that this loop of rope was the blue rope; from its estimated length (36 m) the Panel inferred that either the Casualty did not place any anchors in the blue system above Runner 4, or, what is more likely, that a number of blue anchors above Runner 4 pulled out during the initial fall. From the evidence available, the Panel was able to re-construct part of the blue rope system with a high degree of confidence (Figure 13), comprising: E2, E25, W4, Annex A

a. A one to 1.5 m length used to tie-in the 2nd Climber.

b. An approximate 36 m loop of rope below the 2nd Climber, attached to his belay device, which had formed when the blue rope slack had been taken in.

c. An approximate 13 ± 2 m of blue rope that curved above and right of the 2nd Climber, through Runners 1 and 2 and past the Casualty's feet to a point just below Runner 4.

The physical evidence available to the Panel was, however, insufficient to determine the complete configuration of the blue rope system. In particular, there was no physical evidence of the configuration of the rope in the vicinity of the Casualty. The only evidence available was that of the Winchman.

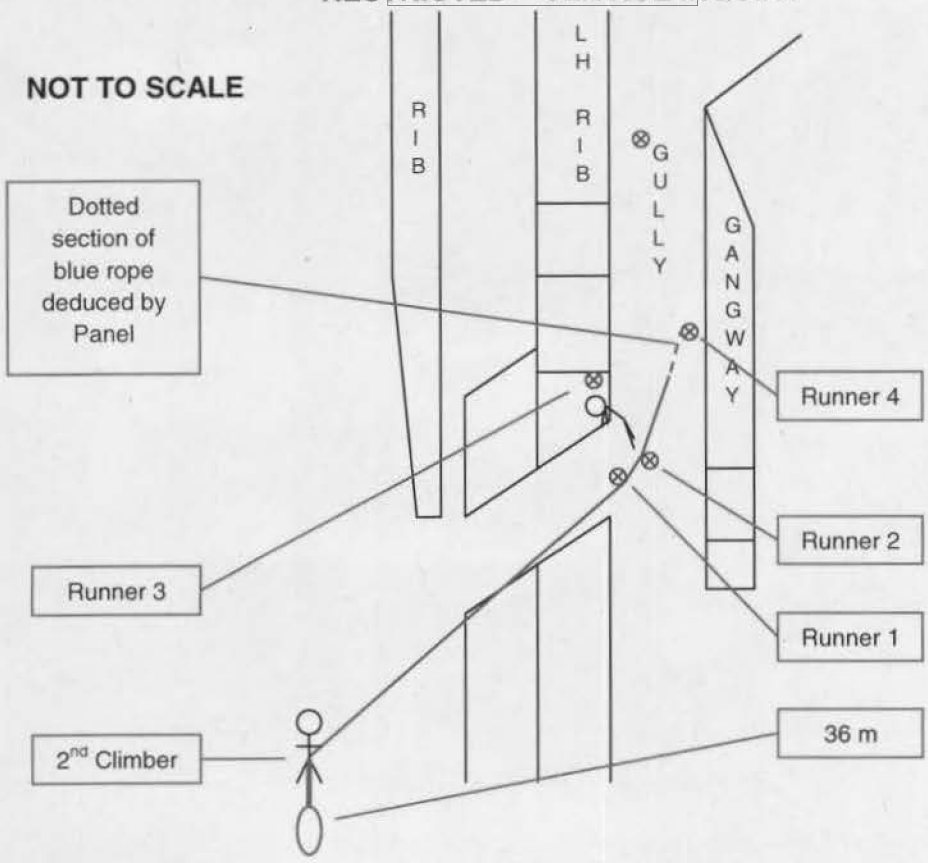

Figure 13 – Partial blue rope system on arrival of Winchman

27. **The Winchman's rope description.** The Winchman described a complex rope situation at the Casualty, reproduced at Figure 14[20]. The Winchman stated the following[21]: W2 E35, E36, E66

a. All of the ropes were under tension, except a slack loop of rope originating around the Casualty's feet.

b. All of the ropes disappeared up to a point unseen.

c. A single blue rope ran over the Casualty, under extreme tension, pinning him to the mountain and disappearing below to a point unseen.

d. He could see no rope attachment points to the Casualty[22].

[20] Rope strands numbered by the Panel for ease of reference.
[21] The Panel examined the Winchman's statements both to the SI and to the Police, together with his handwritten notes made on the day while at Lochaber Base; noting that the total number of ropes was not consistent. In addition, it was clear to the Panel from their interviews with the Winchman that he did not understand the principle behind a rope belay system.
[22] Both ropes were found attached to the Casualty's harness in the standard way; tied through the belay loop on the front. The Panel noted that during a fall the harness can be moved around the climber's body due to the forces involved. It is thus possible that the belay loop could have pulled round to the Casualty's hip, which may have obscured the attachment point from the Winchman.

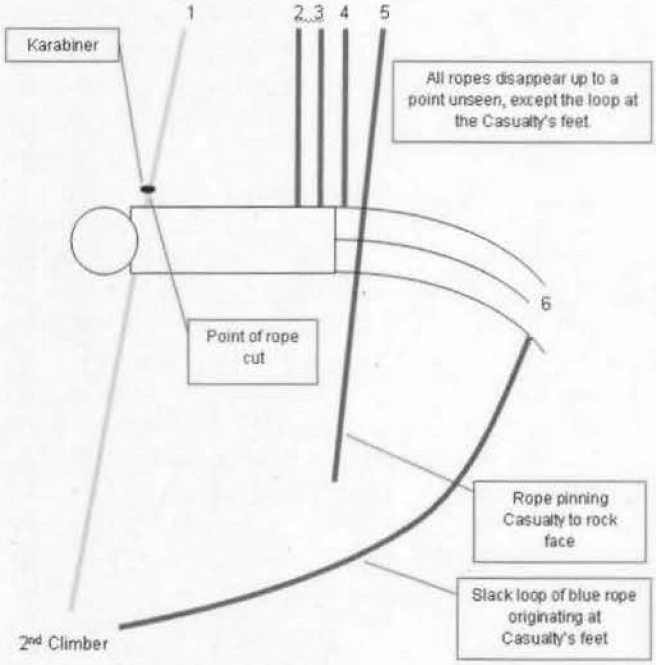

Figure 14 – Winchman diagram of ropes at Casualty

W2

28. **Rope Identification.** The Panel considered each of the strands depicted in Figure 14 in turn: E37, E38, W2, W4

a. Strand 1 was considered to be the yellow rope from the 2nd Climber; a deduction that is consistent with the model of the yellow rope system in Figure 11.

b. Noting the lack of a second yellow rope attached to the Climber, the Panel concluded that one of the 'blue' strands (2, 3 or 4) must have been yellow rather than blue. Given the 2nd Climber's statement that the Casualty did not cross the ropes over and that the Winchman had not seen any twisted ropes, the Panel considered that Strand 2 was most likely the second yellow rope.

c. Strand 3 was considered most likely to be the blue rope connected to the Casualty's harness, running up to an unseen anchor, most likely Runner 4.

d. Strand 6 was most likely the blue rope running in a large bow from the 2nd Climber up to a point above the Casualty on the right side of the gully. The Panel considered it possible that the Winchman may have seen this loop on his approach to the Casualty but not linked it with its continuation above the Casualty; therefore assuming it orginated at the Casualty's feet.

The Panel noted that there were too many strands remaining to fit with a classic leader fall scenario. Equally, the statement that Strand 5 ran up and down to points unseen while pinning the Casualty to the rock face was not supported by statements from the 2nd Climber or any normal understanding of a climbing belay system; however, the Panel noted that the Winchman was adamant about the existence of a rope pinning the Casualty to the rock face (in the location of Strand 5 in Figure 14). The Panel considered that the only scenario which might explain a rope apparently pinning the Casualty to the mountain would be one in which the rope had become wrapped around him.

29. **Formation of a loop in the blue rope.** In considering the likelihood of a loop E71, E72,

forming around the Casualty, the Panel noted the 2nd Climber's comments regarding the Casualty's complaints of leg pain; which could have been exacerbated by a loop of rope caught around his leg which he may have sought to address by asking to be lowered. Given that there may have been significant slack in the blue rope system during the initial fall, the Panel considered it theoretically possible for a loop to have formed. However, the Casualty would either have to had fall into the loop between 2 runners or form it himself by falling onto a straight rope and dragging it through 2 runners. Noting that it is likely that blue anchors were pulled from the ice during the fall (which itself requires tension to be applied by the faller) it is probable that any slack would have been above the Casualty and thus impossible for him to fall through. In addition, given the location of Runner 4 against the wall between the gully and the gangway, the Panel considered it physically unlikely that the Casualty could have fallen into a loop between Runners 4 and 2; especially as the 2nd Climber described him falling on the opposite side of the gully to the blue rope runners. Finally, the loop would have had to remain in situ around the Casualty when the 2nd Climber pulled the slack in. Whilst the Panel considered that the points outlined above were all individually feasible, it required a significant amount of coincidence for them all to have aligned in order to allow a loop to have formed. W4

30. **Effect of a loop in the blue rope.** Accepting that a loop could have formed around the Casualty, the Panel noted that the blue rope system would then have effectively become a three-to-one pulley system in comparison to the yellow rope system. Thus when the 2nd Climber moved to lower the Casualty, for every metre lowered on the yellow rope the blue rope would change by a third of a metre. This would have had the effect of tilting the Casualty slightly and tightening the blue rope around him, which could have caused him an increase in pain. While the 2nd Climber stated that the Casualty looked a "bit tangled in the ropes", he could not recall directly whether there was a loop around the Casualty. Furthermore, he stated that the Casualty was both conscious and coherent but gave no indication he was tightening a loop around him. He also stated that he believed that he would have felt the difference between tightening the blue rope against the Casualty rather than against his harness. Overall, the Panel noted a lack of compelling evidence for the existence of a blue rope loop around the Casualty.

31. **Full blue rope system reconstruction.** Noting that the formation of a loop around the Casualty was very unlikely, the Panel were unable to fully reconcile the Winchman's recollection of the rope situation at the Casualty with the available photographic and physical evidence. The Panel therefore considered how the known facts could be developed to reconstruct the blue rope system that best fitted all evidence and was consistent with climbing norms. Figure 15 represents the most likely reconstruction of the blue rope system upon the arrival of the Winchman; superimposed on the rock face at Figure 16.

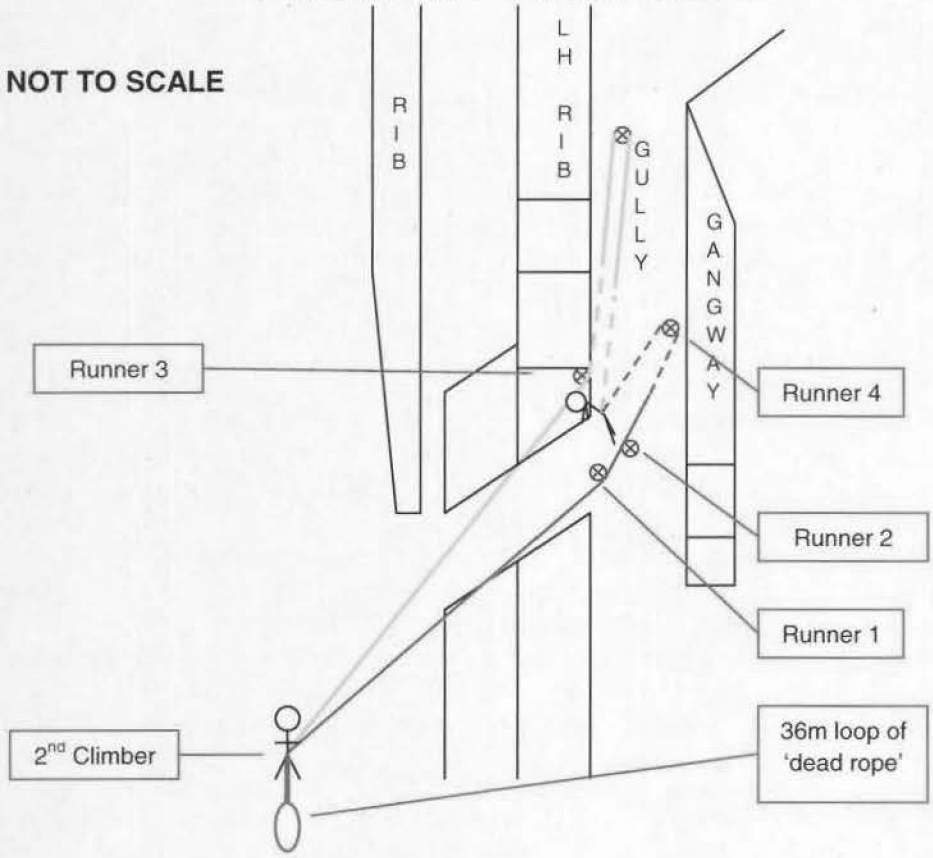

Figure 15 – Full blue rope reconstruction

Figure 16 – Most likely rope system on arrival of Winchman

E72

Blue Rope Severance

32. The Police forensics report established that the blue rope had been severed by a sharp object. In addition, it was noted that the length of blue rope found attached to the Casualty's harness measured 13 m. In the absence of a plausible mechanism or supporting evidence, it was considered unlikely that such a significant length of rope could have become wrapped around the Casualty during his initial fall. Thus the Panel concluded that the blue rope was severed in a return line; specifically, the one running back down from the highest anchor point in the blue system to the 2nd Climber. Having previously established that the blue rope was intact prior to the Winchman's arrival (para 16), the Panel identified 4 potential causes for its subsequent severance: E47, E53, E72, E83, E85, E86, E88-96, W2, W3, W4, W18

a. **A sharp rock feature.** Given the low resolution of the FLIR imagery, the Panel was unable to confirm whether or not the blue rope ran over a sharp rock feature capable of severing it. However, whilst acknowledging the potential for the blue rope to have been weakened as a result of the Casualty's initial fall, the Panel noted that significant frictional forces would have been required to cause a subsequent catastrophic failure. Given the lack of significant tension in the blue rope system post the initial fall and the stability of the Casualty's position on the rock face, the Panel could not identify a realistic mechanism by which the necessary frictional forces could have been generated prior to the Casualty's final fall. Consequently, the Panel discounted a rock feature as the cause of the blue rope's severance.

b. **The Casualty's ice axes.** The Casualty was climbing with a pair of ice axes, attached to his wrists by clips; both were found by a climber on 1 Mar 13, planted in the ice at a position slightly above and to the left of the Casualty's final position on the rock face[23]. From this the Panel deduced that both ice axes remained attached to the Casualty during his initial fall and that at some point during the rescue attempt either the Casualty or the Winchman placed them in their final position on the ice; however, the Winchman stated that whilst he recalled seeing one of the ice axes dangling from the Casualty's right wrist he did not touch either of the ice axes. Therefore, the Panel concluded that the despite his condition, the Casualty must have placed the ice axes in their final position on the rock face[24]. Whilst in theory an ice axe blade can sever a climbing rope under tension, the Panel noted: the lack of significant tension in the blue rope; the limited range of motion through which the Casualty could have swung an ice axe; the most likely direction of ice axe movement to achieve the final position (away from all blue rope strands); and the distance from the Casualty's waist to the blue rope return line (approx 1.5 m). Given these factors, the Panel considered it improbable that the Casualty's ice axes severed the blue rope.

c. **The Winchman's crampons[25].** Throughout the rescue attempt the Winchman's weight was fully on the winch hook due to a lack of footing on the rock face. Indeed, the Winchman stated that whilst with the Casualty his feet were "dangling" and that he didn't recall even 'toe-tapping" the ice. However, in his working position with the Casualty[26] the Panel noted the proximity of the Winchman's

[23] Plotted onto a photograph of the pitch by Witness 18 for the Panel and confirmed by Witness 2 who stated that they were beyond the Casualty's head.
[24] Which could explain the unusual 'non-climbing' placement of one of the ice axes (shaft and pick against the ice with adze pointing up the slope) as reported by Witness 18.
[25] The possibility that the Casualty's crampons severed the blue rope was discounted by the Panel given his condition. Whilst his feet were in the vicinity of the blue rope return line, a (suspected) fracture in his left leg meant that any movement would have been very limited. Moreover, neither the Winchman nor the 2nd Climber reported seeing the Casualty's feet touching the return line.
[26] Placed by the 2nd Climber closer to the Casualty's hip and feet area rather than his torso.
[27] Noting that the type of blue fibres on the J-knife are found infrequently in clothing but are commonly found in ropes, cordage and outdoor equipment such as rucksacks.

crampons to the blue rope return line. Whilst the Winchman did not recall snagging any of the climbing ropes, the Panel noted that despite the relatively stable hover position maintained by the Pilot, the Winchman was pulled away a "couple of times". Given the known (albeit small) risk of crampons damaging a climbing rope if caught whilst kicking the toe points into the ice, the Panel could not rule out the possibility that the Winchman's crampons had inadvertently severed the blue rope return line. However, in the opinion of the Panel this was considered an unlikely, but not improbable, cause.

d. **The Winchman's J-knife.** The Police forensics report established that blue nylon fibres found on the J-knife blade (specifically between one of the blades and the orange shaft section of the tool) were not from the yellow rope nor the Casualty's rucksack; and were indistinguishable from the blue nylon fibres in the outer sheath of the blue rope. Given the extant maintenance policy requiring J-knife blades to be inspected and cleaned by Survival Equipment personnel post use (or immersion in salt water), the Panel initially considered it unlikely that the blue fibres had come from an unrelated rope or textile fabric[27] as a result of the J-knife's use prior to the incident. However, the Panel noted that following the J-knife's last maintenance on 21 Jan 13, D Flt 202 Sqn had conducted 28 SAROPs up to and including the incident in question on 25 Feb 13. Of the 7 winchmen tasked with SAR duty on the Flt over this period, 6 confirmed that they had not used a J-knife operationally during the period. However, the 7th (Witness 2) was unable to recall whether or not he had used a J-knife prior to 25 Feb 13 nor whether he had complied with the maintenance policy. Noting his involvement in 3 SAROPs on 23 Feb 13, the Panel were therefore unable to categorically rule out the possibility that the fibres found on the J-knife by the Police were present as a result of its use on a previous SAROP. However, on the balance of probability and the evidence available, the Panel considered it feasible that the blue rope could have been cut by the Winchman's J-knife at some point during the rescue attempt. The potential means by which this could have occurred are discussed at paras 34, 35 and 36.

33. The Panel considered how it was that the 2nd Climber had not noticed the severance of the blue rope given that he was holding a degree of tension on it; albeit small. Given the position[28] of the lowest anchor in the blue rope system (Runner 1), the Panel judged that it was very unlikely that the severed blue rope could have dropped from the point of severance and hung counter-balanced either side of the runner; rather its weight was more likely to have pulled the severed end through Runner 1 towards the 2nd Climber (Figure 17). Whilst the 2nd Climber reported having to shelter due to the helicopter downdraught, he also stated that he looked over at the blue rope every 5 to 10 s. Consequently, if the blue rope had been severed significantly before the yellow rope the Panel were of the opinion that the 2nd Climber would have seen the rope fall. The Panel therefore concluded that the blue rope was severed shortly before the yellow rope; during which time the 2nd Climber could have been distracted by the Winchman asking to cut the yellow rope and the ensuing events. E18, E38, W4, W18

[28] Approximately 2 m below and to the right of the Casualty. Accurately established by W18.

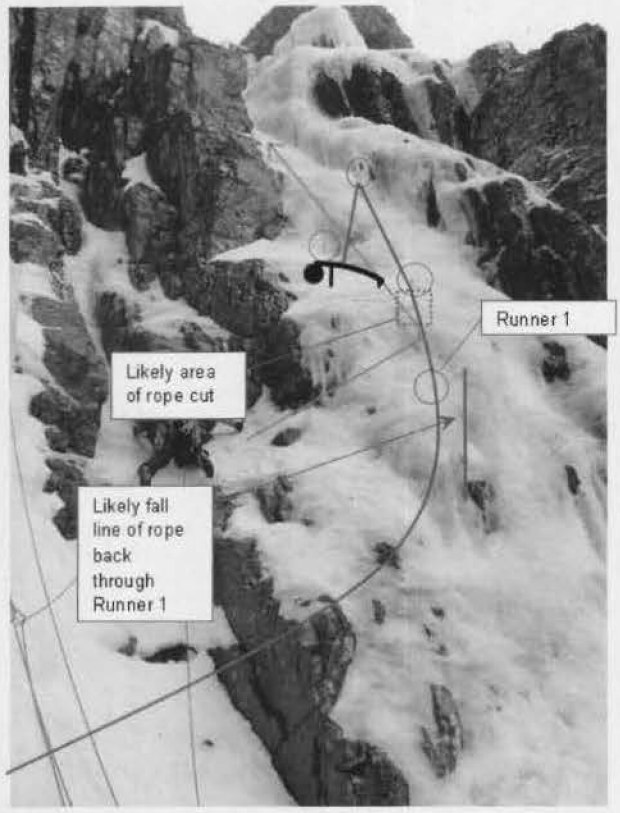

Figure 17 – Severed blue rope fall-line

34. In attempting to determine the means by which the blue rope was severed, the Panel focussed upon the 3 cuts the Winchman confirmed making[29]: W2, W3

a. One to cut the yellow rope.

b. Two to cut off the rucksack, one for each strap.

35. The Panel first considered the possibility that the blue rope was severed whilst cutting the yellow rope; previously established to be the furthest left rope strand as viewed by the Winchman. The Winchman stated that he cut the yellow rope just above the Casualty's shoulders[30]. In order to have simultaneously cut the return line in the blue rope, the Winchman would have had to inadvertently drag it over to the left by approximately 2 m, an action the Panel considered unlikely given: the hand-tight tension in the blue rope; the presence of the blue rope strand attached to the Casualty's harness; and the fact that the Winchman was hanging on the winch hook with no purchase on the ice[31]. In addition, the Winchman stated that he made all cuts in a slow and deliberate manner. It would therefore be difficult to imagine that he had not noticed that he had gathered 2 ropes in his hand rather than one. The Panel concluded that it was extremely unlikely that the blue rope was cut whilst cutting the yellow rope. E2, W2, E35, E36

36. The Panel then considered the possibility that the blue rope was severed whilst E2, E51,

[29] Noting that these were the only cuts the RadOp (Witness 3) recalled seeing the Winchman make.
[30] As depicted in Figure 14.
[31] He would thus have obtained little or no leverage to drag the blue rope; whether deliberately or by accident.

cutting the rucksack straps. Noting that the Winchman stated that he cut the rucksack chest and waist straps, the Panel examined the Casualty's rucksack and found them intact; however, the rucksack had been cut at the base of each shoulder strap[32]. The Panel postulated that the Winchman could have cut the blue rope return line inadvertently by gathering it up with one of the rucksack straps[33]. However, given the position of the return line relative to the Casualty (as described at para 31), the Winchman would have had to unintentionally drag it over to the left by approximately 1.5 m to place it in the vicinity of the Casualty's waist; potentially during the Winchman's move from the 2nd Climber to the Casualty. However, the Panel could find no evidence to suggest that the Winchman moved to a position to drag the blue rope return line back towards the Casualty[34]. Consequently, the Panel concluded that it was unlikely that the Winchman cut the blue rope inadvertently with the rucksack. E36, E48, W2, W4

Summary

37. It was established that the strops were never attached to the winch hook and that the yellow rope was cut intentionally by the Winchman. Whilst the Panel considered that it was most likely that the blue rope was severed shortly before the yellow rope was cut, the mechanism by which this occurred could not be positively determined.

Cause

38. The evidence led the Panel to determine that the cause of the accident was the severance of both ropes during the rescue attempt, in conjunction with the decision not to connect the strops to the winch hook prior to cutting the yellow rope. However, the Panel could not positively determine precisely when or how severance of the blue rope had occurred.

Factors affecting the accident

39. Having attempted to establish the cause of the accident, the Panel examined the factors that led to the cause. If the strops had been connected to the winch hook before the ropes had been cut, the Casualty would not have fallen; this aspect is covered in para 41. The Panel then went on to examine why the Winchman decided not to connect the strops to the winch hook; this is covered in the ensuing paras. Finally, the Panel made observations on the post-incident management and considered Health and Safety and Environmental implications. Analysis was conducted in accordance with MilAAIB SI Guidance Note 4, which is provided at Annex C.

[32] Rucksacks usually have a padded section that is designed to run over the carrier's shoulder with a thinner webbing section with a buckle to adjust the strap length. The Casualty's rucksack had these features and the straps had been cut on the lower, thinner section.
[33] A Rope-cutting exercise conducted by the Panel (Annex B) confirmed that the combination of rope and rucksack strap made no difference to the force (or time) required to cut vice a rope on its own.
[34] Evidenced by the voice-marshalling of the helicopter that the Winchman moved directly from the 2nd Climber to the Casualty and did not overshoot; supported by the 2nd Climber, who stated that the Winchman 'flew' directly to the Casualty's position.

40. All the factors have been classified in accordance with the same Guidance Note but the Panel chose to adapt them to address the specific nature of this accident. The definitions[35] used by the Panel are as follows: Annex C

a. **Causal factors.** Causal factors are those factors which led directly to the accident or incident. Therefore if a Causal factor is removed from the accident sequence, the accident would not have occurred.

b. **Contributory factors.** Contributory factors are those factors that made the accident more likely to happen. They did not directly cause the accident to happen; if a Contributory factor is removed from the accident sequence, the accident would probably still have occurred. The Panel made an additional distinction between **Major** and **Minor** Contributory factors to differentiate between different levels of severity.

c. **Observations.** Observations are points or issues worthy of note that the Panel discovered during their investigation but that do not relate directly to the accident being investigated.

Causal factors

41. **The straps were not connected to the winch hook.** The Winchman did not connect the straps to the winch hook before cutting any ropes. There is no SOP for the situation encountered by the Winchman, which is referred to as a 'hung-up climber', nor are there any orders covering it. The Panel interviewed 5 authoritative winchman from the SARF: the 202 Sqn WTO; the 203(R) Sqn RTO; the SAR STANEVAL winchman; the 22 Sqn WTO and the 22 Sqn A Flt Training ('T-Cat') winchman[36]. All 5 testified that in their experience of the rescue of hung-up climbers, they had always followed a sequence: place the straps on the casualty; connect the straps to the hook; and then cut ropes[37]. This sequence is taught to RAF winchmen during their initial training (but was missed for the Winchman in this incident (see para 55)). All witnesses bar the 203(R) Sqn RTO stated that they could see no need to ever break this sequence, particularly when an understanding of the situation is limited. If this sequence had been followed the accident would not have occurred. The Panel concluded that the fact that the straps were not connected to the winch hook was a Causal factor. The Panel recommends that the SARF introduce a SOP for hung-up casualties[38], to include the baseline sequence of 'Straps onto the casualty, Connect straps to the hook, Cut'. The straps must be connected to the winch hook before any ropes or climbing equipment is cut. This applies at any time where a casualty could be at risk of a fall to further harm (noting that this does not apply exclusively to mountaineering situations). This recommendation is supported by the RAF CAM HF Report at Annex D (paras 38a and b). W2, W7, W9, W10, W16, W17, Annex D

[35] The category 'Aggravating factors' is not used since the definition is 'factors that made the final outcome of an accident worse'; this would clearly not apply. The Panel did not find any 'Other factors'.
[36] The Panel also interviewed one senior winchman from a civilian SAR company (W15) but he had not experienced a hung-up climber situation.
[37] None of the winchmen interviewed cut any ropes to simplify the situation before connecting the straps to the hook. RAF winchmen are not taught on 203(R) Sqn to cut ropes before connecting the straps to the winch hook.
[38] The term 'casualties' is preferred to 'climbers', since the casualty may be suspended from a rope system in non-climbing situations, for example, rope access systems on tall buildings.

42. **The decision not to connect the strops to the winch hook.** Twice before he left the helicopter, the Winchman stated that his intention was to place the strops on the Casualty, connect the strops to the winch hook and then cut the ropes. This was not the sequence that he followed. Therefore, the Panel considered whether the Winchman had committed an unintentional error (cognitive failure); either forgetting to connect the strops (memory lapse) or failing to complete a routine action (attentional slip). However, the Panel noted that the Winchman stated on more than one occasion that he had deliberately modified his prior plan once on-scene due to the unexpected complexity of the rope system. Furthermore, rope-cutting rescue situations are sufficiently infrequent in SAROPs to preclude the sequence from becoming a rehearsed action. Equally, the Winchman was unable to reconcile the situation before him with either a previous rescue situation or the rope-cutting exercise undertaken during his Refresher Course (para 55), so that it is unlikely that he imposed an inappropriate, ready-made solution to the problem. In his previous experiences of rope-cutting situations he had employed the 'strop-connect-cut' sequence so that it is unlikely that he had developed an incorrect habit. The Panel therefore concluded that the Winchman did not commit an unintentional error but that he made a deliberate decision not to connect the strops to the winch hook before cutting the rope. E2, E51, W2

Major Contributory factors

43. **Factors affecting the decision not to connect the strops to the winch hook.** The Winchman stated that the following factors affected his decision not to connect the strops to the winch hook: W2

a. The risk of Winchman or Casualty injury in the event of a flyaway.

b. The time required to cut the ropes.

c. The complexity of the rope system.

The Panel noted that, fundamentally, the Winchman was concerned with balancing the risk to the ac, Casualty and himself in the event of a flyaway with the time they would be collectively exposed to that risk; which was affected by the time required to cut the ropes. This suggests a clear understanding of the SAR safety priorities, namely: ac safety first; Winchman safety; and finally casualty. It was his desire to minimise the time they would be exposed to a flyaway risk that resulted in his decision not to connect the strops to the winch hook before cutting ropes. The factors affecting this decision are examined in the next 3 paras.

44. **Risk of Winchman or Casualty injury in the event of a flyaway.** The Winchman has stated that the Personal Injury Accident Report of 31 Aug 98 relating to Sea King XZ589 was in his mind during the rescue. During the 1998 accident the winchman connected the strops to the casualties while they were also attached to the rock face by a climbing rope. The helicopter then encountered a downdraught and was forced to execute a flyaway, ripping the winchman and casualties off the face and into a buttress; resulting in major injuries to the winchman. The Winchman believed that the 1998 report recommended that the amount of time that a helicopter is attached to the hillside through the strops during a SAROP should be minimised. He stated that, as a result, he was very reluctant to connect the strops to the hook and first planned to cut away ropes that he regarded as uninvolved in order to minimise the time-at-risk. However, the Panel noted that the 1998 report did not make recommendations concerning attaching the helicopter to the hillside, but recommended that crews 'be reminded of the risks involved'[39][40]. Furthermore, the conditions on the day were very stable and there was very little risk of a downdraught; the Winchman would have been aware of this both from the very low wind value and from the very stable torque values called by the pilot. The only condition that would have resulted in a flyaway was an engine failure, which was improbable given the time-at-risk, even allowing for a maximum 2-3 min exposure[41]. It would appear that the risk of a flyaway became over-emphasised by the Winchman as a result of his perception of the 1998 incident. The Panel concluded that the Winchman's over-estimation of the risk associated with attaching the helicopter to the hillside was a Major Contributory factor in the accident and noted that this may be true among the wider SAR winchman fraternity; the risk is mentioned during training but apparently not balanced by a consideration of the number of rescues that have occurred without engine failure. The Panel recommends that the SARF balance the emphasis placed by winchmen on the risk of attaching the helicopter to the hillside during winching operations, with the other risks the situation may present. This should be applied to both initial training and continuation training.

E2, E3, E51, E75, E76, W2

45. **The time required to cut the ropes.** The Winchman stated that he had estimated the time that it would take him to cut the 4 ropes was up to 2 or 3 mins[42]. Testimony from 2 authoritative winchmen[43], based on similar incidents with hung-up climbers, indicates that an estimate of up to 30 sec (maximum) would be more accurate. The Panel asked the Winchman what had led him to consider that it would take him such a relatively long time to cut the ropes. Five factors were highlighted which the Panel investigated accordingly:

E33, E51 W2, W4 W7, W9 W10, W16, W17, Annex B

a. **The time to cut each rope**. The Panel conducted a rope-cutting exercise, detailed in Annex B which established that very little time or force is required to cut 9 mm ropes with a J-knife (less than one sec per rope). The Panel concluded that it would have taken very little time (<30 sec) to cut a number of ropes sequentially; even allowing for the complexity of the rope situation as described by the Winchman

[39] The Panel attempted to trace the action that had been taken by HQ 11/18 Gp to implement the recommendations of the 1998 report. The Board of Inquiry Recommendations Progress Report contains the recommendation that "crews be reminded of the risks involved in placing strops on casualties who are attached to a rock face". The action is placed on HQ 11/18 Gp and is marked as 'closed', stating "SOPs amended". The implication is that an SOP for dealing with hung-up climbers existed at that time. The Panel attempted to track down previous versions of the SARF SOPs through both HQ 2 Gp and SARF HQ but no records were available prior to 2007 and there is no record of an SOP from 2007 to date (Exhibits 75 and 76). The Panel considered that the wording in the Recommendations Progress Report was incorrect and that the most likely course was that winchmen had been briefed on the risks and that brief incorporated into winchman training. This is supported by the fact that this risk is included in current training (Exhibit 28 - Hung Up climbers).

[40] It is worth noting that the report also outlined an alternative method for winchmen which involved connecting the strops to the hook once they had been placed around a casualty; albeit this was not included as a formal recommendation.

[41] Noting that there are a number of other ac emergencies that can necessitate the immediate departure of the helicopter from a SAROP.

[42] He later, when questioned as to how he arrived at this figure, reduced his estimate to "a minute or so".

[43] Specifically the 202 Sqn WTO (Witness 7) and the SARF STANEVAL Winchman (Witness 9).

and the conditions under which he was operating.

b. **The need to confirm with the 2nd Climber**. The Winchman stated that he needed to confirm with the 2nd Climber the safety of the '3rd climber' before cutting ropes. The need to ensure the safety of other climbers before cutting ropes is underlined by testimony from 5 authoritative winchmen and the Panel agrees. What is not clear is why this would add so much more time to the rope-cutting sequence; in the view of the Panel, confirmation with the 2nd Climber would only need to have been done once. Furthermore, the Winchman had already made clear during the 'Airwave' call to the 2nd Climber that all other persons would need to make themselves secure because he would be cutting ropes; the 2nd Climber had understood this requirement and told the Winchman that he could cut ropes. The Panel concluded that confirmation with the 2nd Climber should not have added significant time to the rope-cutting.

c. **The time to stow and retrieve the J-knife between cuts**. The Winchman stated that he preferred to stow and retrieve the J-knife between cuts and that this would add time to the rope-cutting. He stated that he was concerned by the risk of the J-knife, which is very sharp, cutting other items inadvertently, while he connected the strops to the winch hook. A picture of the J-knife is at Figure 18. While the design of the knife makes it difficult to cut items unintentionally, the Panel accepted that it was sensible to stow the J-knife while placing the strops. On the other hand, the Panel judged that it would have been perfectly acceptable to keep the knife out for cutting operations once the strops were in place. The Panel concluded that this should not have added significant time to the rope-cutting.

d. **The time to get the J-knife into position in the hand.** The Winchman stated that it would take time to get the J-knife into the correct position and that this was important because it is possible to "get it wrong"; emphasising the importance of ensuring that the blades of the J-knife faced away from the winch wire so that there was no risk to the wire when cutting. The Panel understood this risk and the need to mitigate it but did not consider that this would have added significant time to the rope-cutting.

e. **The potential to be dragged out of position.** The Winchman stated that he could have been dragged momentarily from his working position and that this would have added to the time required to cut the ropes; noting that he was dangling without a foothold and was thus totally reliant on the pilot's ability to maintain an accurate position in the hover. However, there was no turbulence on the day and the Winchman reported that he was held in a good position throughout with only occasional, minor excursions. The Panel concluded that while the potential to be dragged out of position was low, it was a credible factor in the Winchman's estimate of the total time required.

Having analysed all of the factors stated by the Winchman, the Panel concluded that he overestimated the time required to cut the ropes and that this was a Major Contributory factor in the accident. [redacted]

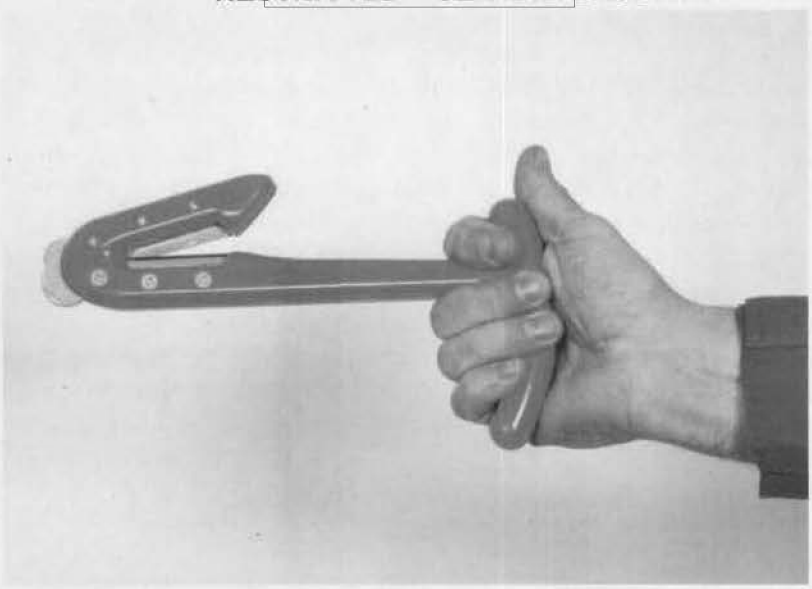

Figure 18 – A winchman J-knife

46. **Complexity of the rope system.** The Winchman described a very complex rope system at the Casualty. When the 2nd Climber told him that the Casualty was secured by 2 ropes, the Winchman expected the Casualty to be hanging from 2 ropes (Figure 19). When the Winchman arrived at the Casualty there appeared to be more than 2 ropes. From his statements, it was clear to the Panel that he did not understand the rope system before him. Having failed to clarify the exact climbing situation during the 'Airwave' call with the 2nd Climber (see para 48), he was unaware that the Casualty had been the lead climber and that the belay system used would therefore result in 2 ropes looking like 4. He also stated that he had deduced that the yellow rope was least likely to be involved in the security of the Casualty[44]. The Panel concluded that the Winchman's lack of understanding of the rope system was a Major Contributory factor in the accident. However, the Panel elected not to recommend training in rope systems for winchmen. The adoption of a SOP to 'Strop, Connect, Cut', coupled with the speed and ease with which ropes can be cut, would make an understanding of rope systems superfluous. Moreover, given the multiplicity of rope systems that could be employed by climbers or in non-climbing situations[45], such training could become protracted with little value added. Finally, current 203(R) Sqn training teaches winchmen that if the situation is difficult then the winchman should consult the crew and consider the option to seek MRT assistance[46]. E2, E36, W10

[44] The Panel considered that the Winchman could have applied this logic equally to the blue rope.
[45] Rope systems could be used equally by workers using rope-access techniques, such as window cleaners.
[46] The Panel noted that the RAF CAM HF Report (Annex D) recommends that the difficulty of the hung-up climbers exercise be considered (para 38b). The report highlights at para 13b that the extant exercise only involves cutting a single rope and therefore does not require any decision making on behalf of the student winchman with regard to which rope to cut. However, the Panel considered that increasing the complexity of the rope-cutting exercise would introduce considerable implementation challenges. Accordingly, the Panel does not support this element of the HF Report recommendations.

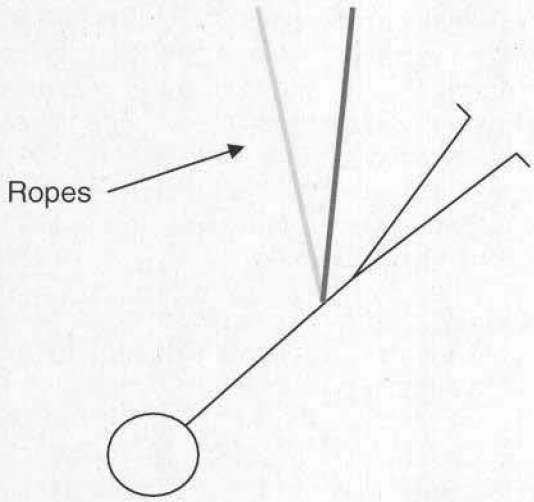

Figure 19 – Winchman drawing of ropes expected at Casualty

47. **The Winchman's obligation to rescue.** As the Winchman winched out of the helicopter, he had a clear, pre-briefed option that if he felt it was too difficult the crew would abandon the rescue and seek MRT assistance. However, once on-scene, the Winchman stated that he felt an overwhelming sense of moral obligation to rescue the Casualty, due primarily to his assessment of the Casualty's medical condition[47]. This obligation may have affected his professional judgement; he has stated that he found the rope system complex and it is clear that he did not understand it[48]. He did not use the Polycon to consult the crew, nor did the crew check in with him during the 8 mins that he was with the Casualty. There was an abrupt shift in the centre of gravity for on-scene decision-making from the crew to the Winchman once he had deployed from the helicopter. This shift would appear to be standard for the SARF and is an unavoidable consequence of winch operations; the winchman is the only crew member who can see at first hand what is actually on-scene. However, he is also the only crew member who makes human contact with a casualty. Current training underlines the option for the winchman to consult the crew either via Polycon or by winching back up to the helicopter if the situation requires. It is noted, however, that the onus is on the winchman; the crew, quite appropriately, will be reluctant to disturb the winchman on the wire. This leaves a weakness in the system; the person expected to initiate communications that could result in a withdrawal from a rescue is also the person who will feel most obliged to carry out the rescue. The problem is that a winchman may feel obliged to make a rescue that either increases risk to a level above that which might be acceptable to the crew or takes him beyond his own ability. While initial training may introduce the issue, the Panel notes that it takes a strong will to winch away from a casualty in peril, even if only to consult with the crew. This issue cannot be a new one for the SARF. In this incident, however, the moral obligation to rescue may have pushed the Winchman to attempt to resolve a situation which was beyond his understanding. The Panel concluded that the Winchman's obligation to rescue was a Major Contributory factor in the accident. The RAF CAM HF report also highlighted the

E2, E51, W1, W2

[47] The Panel noted conflicting testimony relating to the Casualty's medical state. The 2nd Climber stated that the Casualty was improving with time after an initial period of confusion following the first fall. He also stated that the Casualty could understand what was being said to him and had said that his head was fine. Both the 2nd Climber and the Winchman state that the Casualty tried to move to help with the removal of the rucksack. The Casualty is visibly active on the FLIR video footage. The Winchman stated that he felt that the Casualty's condition made it likely that he would die if the Winchman did not effect a rescue. The Casualty's fatal fall makes it impossible for the Panel to determine definitively his medical condition prior to the yellow rope being cut.

[48] The Panel drew this conclusion because (for example) the diagram the Winchman drew for the Panel did not include a yellow rope attached to the Casualty, which logic dictates there must have been. He has also stated that he did not know where climbers normally attach their belay ropes to their harnesses and commented repeatedly how complex the rope system was.

negative impact of pressure on the Winchman (Annex D, para 40)[49]. The report also noted that greater communications between the crew members can improve team co-operation and so improve decision-making (Annex D, para 41). The Panel recommends that SARF implement training on the management of risks associated with the moral obligation to rescue[50] and the requirement for winchmen to consult with the crew if the situation is radically different from that assumed before they left the helicopter. RAF CAM should be consulted to review such training against the latest practice in this area. This should be applied to both initial training and continuation training.

48. **Misunderstanding about the '3rd climber'.** The presence of the supposed '3rd climber' was a factor in the Winchman's estimation of the time required to cut the ropes (see para 45). Only the Winchman raised the possible presence of a '3rd climber'. When the Lochaber MRT passed the incident details to the ARCC at 1251 the climbing party was thought to comprise 2 members. Since this number could not be confirmed, however, the ARCC passed the information to Rescue 137 as the Casualty being with a 'party' of climbers. The Winchman stated that when he spoke to the 2nd Climber on the 'Airwave' he formed the impression that he was in a party of 3 climbers[51]. This impression was reinforced for him as the helicopter arrived on-scene; when he saw the ropes leading up above the Casualty he thought that they must be leading up to the '3rd climber'[52]. He stated that it was further reinforced when the 2nd Climber did not speak to him on-scene; the person on the 'Airwave' call had been talkative. It is not clear whether, during the 'Airwave' call, the Winchman asked the 2nd Climber directly how many were in the climbing party[53]. Even if he had, it is not clear why the 2nd Climber would have said that he was in a party of 3. The Winchman's confusion could have been avoided had he been sure to ask the 2nd Climber how many were in the party. The Panel concluded that the misunderstanding about the '3rd climber' was a Major Contributory factor in the accident. This conclusion is supported by the RAF CAM HF report (Annex D), which noted that 'uncertainty' was a contributor to task complexity and decision making (para 39). The Panel recommends that the SARF compile a standard aide-memoir of informant questions for use during radio and 'Airwave' calls. This should include, for example, asking for the number of members in the party, the clothing they are wearing, whether they have any locations aids, and a description of their exact location. This recommendation is supported by the RAF CAM HF report. E2, E35, E60, W2, W12

Minor Contributory factors

49. **Dependence on the 2nd Climber.** The Winchman believed that all ropes were under tension. If the Winchman had checked the ropes by feeling them, he would have established that only one rope was actually weight-bearing; the yellow rope, which would have been visible to him as 2 strands of rope. The Winchman opted to rely on the 2nd Climber's assessment of the status and integrity of the rope system, however. The 2nd Climber was below the Casualty and could not see the full rope system. Equally, the Winchman relied on the 2nd Climber to manage the risk to the '3rd climber' when he began cutting ropes. The Panel concluded that the Winchman's dependence on the 2nd Climber W2, W10

[49] Which also highlighted the challenging operating environment winchmen are required to routinely operate in and noted that whilst the rescue situation fell within 'normal bounds', there were a number of environmental characteristics present that increased the task difficulty, specifically: the lack of footing for the Winchman; the significant drop below the Casualty; and the confined operating space due to the proximity of the rock buttress.
[50] The 2 key risks are that the winchman might take on more risk during the rescue than the crew would be comfortable with, and that the winchman might feel obliged to make a rescue that is beyond his technical ability.
[51] Noting that the 'Airwave' radio is not recorded on the FLIR video tape.
[52] In the opinion of the Panel, it did not occur to him at this point that the ropes might be part of a counter-balance belay system.
[53] The Winchman's statements are unclear. In one he states that he was sure the 2nd climber told him there were 3 climbers, in another he cannot recall asking the 2nd Climber at all.

for information was a Minor Contributory factor in the accident. There is evidence that this dependence on climbers to understand absolutely the situation around them may not be limited to the winchman involved. The Panel recommends that the SARF remind all winchmen that although climbers, or similar casualties in technical situations, may be experts in their field, their understanding of the rescue situation may be limited. The survivor may also have a misunderstanding of the situation. The winchman must conduct his own assessment before taking a critical action.

50. **The Winchman's perceived pressure to perform.** [redacted] E2, E51, W2

[redacted] the Panel considered that the Winchman felt a perceived pressure to perform. [redacted]

51. **External sources of pressure.** The perceived pressure to perform may have contributed to the Winchman's decision to winch out rather than stay on board and get MRT[55]. The Panel considered the following potential sources of external pressure: E2, E6, E41, E51, W2, W6, W7, W8, W9, W10, W11, W13

a. **Crew.** The Panel noted from the FLIR video that the crew recognised the Winchman's concerns and were supportive. The Panel judged that if the Winchman had said that he did not wish to do the job, the crew would have backed his decision. The agreed plan before he left the helicopter was for him to take a look and that if he was not happy he could return to the helicopter and the crew would fetch the MRT. The Panel concluded that, while there was an appropriate sense of urgency to complete the task, there was no untoward pressure on the Winchman from the crew.

b. **Command chain.** [redacted] The Panel considered that adequate supervisory support had been provided to the Winchman and that there was no external pressure on the Winchman from the Flt.

c. **Elitism.** The Panel was concerned that the Winchman felt a pressure to perform because he was a 'Lossiemouth winchman'; potentially arising from an elitist culture amongst RAF Lossiemouth SAR personnel. The Panel was keen to establish whether the perception was born from a cultural difference between D Flt, 202 Sqn and the rest of the SARF. The Panel investigated this aspect through interviews with the 202 Sqn WTO, the SAR STANEVAL winchman, the 203(R) Sqn RTO, OC 22 Sqn, OC 202 Sqn and OC 203(R) Sqn. The Panel found no evidence of an existing cultural difference. [redacted]

[54] At one point stating "It's going to be unbelievably complex from my point of view. I am beginning to veer towards MRT I must say".
[55] Noting that his final decision was primarily based upon the length of time it would take the MRT to reach a casualty with potentially life-threatening injuries.

[redacted]

The Panel concluded that the Winchman's perceived pressure to perform was a Minor Contributory factor in the accident. There is no evidence, however, to suggest that any external pressures played a part. In particular, there is no evidence to suggest an inappropriate elitist culture within D Flt. Accordingly, the Panel does not recommend any action.

52. **Time pressure on the Winchman.** Just before the Winchman was lowered out of the helicopter, the Co-pilot briefed that they had 20 mins available in the hover. The crew considered that this allowed plenty of time for the rescue. Nevertheless, the Winchman stated that once he had deployed from the ac he felt under time-pressure to complete the task. The Panel judged that this may have decreased his ability to think prudently through what he was doing[56]. The Panel concluded that the Winchman's perceived time pressure was a Minor Contributory factor in the accident. The Panel noted that there were no time-remaining calls from the ac to keep the Winchman's sense of time awareness at an appropriate level. However, such calls can be a double-edged sword, in that they can apply pressure as well as relieve it. Moreover, it can, in certain SAR situations, be entirely appropriate for the winchman to be encouraged to be expedient. As a result, the Panel did not make any recommendations regarding time pressure. E2, E51, W2, W3, W5

53. **The crew decision not to listen to the 'Airwave' call.** The crew decided not to listen to the Winchman's 'Airwave' call to the 2nd Climber. The 'Airwave' system is set up such that all crew members can participate in a call, or rearcrew only, or just one crew member[57]. To avoid the 'Airwave' call becoming a distraction to the pilots, the SARF SOPs recommend that the system be set up such that just one crew member can transmit and receive on the 'Airwave'. The crew of Rescue 137 followed the SOP and thus only the Winchman could hear the conversation with the 2nd Climber. As such, only he was able to record all of the detail and ask questions. When the Winchman finished the call, which was prolonged[58], he stated that it was a pity that the crew had not been able to hear it since it contained so much information. While the 'Airwave' radio can be a distraction to safe ac operation, on this occasion the helicopter was operating in open (Class G) airspace, in good weather with little radio traffic and no air traffic control. The Panel considered that the 'Airwave' call could have been monitored with no impact on Flight Safety. Conversely, with more of the crew monitoring the call, more information could have been gleaned from the 2nd Climber, any confusions (such as the '3rd climber') might have been resolved and the crew may have prompted the Winchman to ask specific questions. The Panel concluded E2, E14, E51, E74, W1

[56] This is supported by the HF Additional Assessment Report (Annex E, para 8).

[57] The Airwave Communication System is carry-on equipment providing communications through the ac intercom on the Airwave network used by other emergency services. The ac intercom is the system that allows the crew members to speak to each other through their headsets and microphones. The intercom system may be selected by the pilots to PRIV (Private) or ALL, using a switch in the cockpit. In normal use, the intercom is set to ALL and all crew members can speak to each other. If necessary, the intercom can be selected to PRIV; this splits the intercom so that the Pilot, Co-pilot and RadOp can speak to each other but are isolated from the 3 remaining intercom boxes. This allows the rearcrew to chat without disturbing the pilots. The Airwave radio connects to the intercom and is controlled via the ac Communication Control System, either by the Co-pilot using the pilots' box (consisting of a Press-To-Transmit (PTT) switch and a toggle switch with AIRWAVE & I/C or I/C only selections), or by the rearcrew using the rearcrew box (a PTT switch). In order to use the Airwave, the pilots' box toggle switch is set to AIRWAVE & I/C. All crew members are then connected to the Airwave through the intercom; in this set-up, everything said on crew intercom is transmitted over the Airwave and equally the Airwave radio can be heard by everybody. This can be very distracting so the SOP is for the pilots' box to be set to AIRWAVE & I/C and the intercom to be set to PRIV. The pilots and RadOp can then converse and operate the other radios normally, without being distracted by the Airwave conversation. The winchman ensures that he is connected to the appropriate cabin intercom box and operates the Airwave radio. In this arrangement, only the rear-crew member (normally the winchman) who is connected to the corresponding intercom box would be able to transmit/receive Airwave communications.

[58] The 'Airwave' call to the 2nd Climber lasted 7 mins.

that the decision not to listen to the 'Airwave' call was a Minor Contributory factor in the accident, in that it could have resolved the issue of the '3rd climber'. The Panel noted that the SARF SOP on the use of the 'Airwave' system is restrictive and precluded the crew from operating optimally. The Panel recommends that the SOP governing the use of the 'Airwave' system be amended to encourage more than one crew member to engage in critical calls to informants, as opposed to channelling the crew down the line of only one crew member engaging. It is possible for both rearcrew to listen to Airwave while not distracting the pilots.

Specific factors excluded

54. The Panel considered several other factors that might appear pertinent but were excluded as factors in the accident. These are covered in the ensuing paras and include:

a. The Winchman's training.

b. Crew Fatigue.

c. The Winchman's communication with the 2nd Climber on-scene.

d. The influence of Overspeed Trip Governor incidents.

55. **The Winchman's training.** The Panel investigated the Winchman's training. At the time he completed the Sea King Conversion Course [redacted] there was no exercise to train winchmen in the rescue of hung-up climbers. [redacted] an exercise to cover this was devised and incorporated into the syllabus, including a rope-cutting serial. This training includes a clear baseline sequence of attaching the strops to the casualty, connecting the strops to the hook and then cutting the ropes. SAR winchman training carries a caveat, however, to the effect that it may be modified depending on the circumstances of a particular rescue. Training provides winchmen with the basic toolset for a variety of rescue situations; winchmen are expected to modify it as a function of their experience and the conditions of a given rescue situation. [redacted] he completed the Winchman Refresher Course at 202 Sqn under the tutelage of the Sqn WTO[59]. The course included the rope-cutting serial[60]. The WTO did not teach the Winchman the baseline sequence of 'strop-connect-cut', however; considering it to be too basic for such an experienced individual and not wishing to patronise him. As a result, the Winchman was never formally taught the baseline sequence for hung-up climbers. It should be noted that even if he had been taught it, he was at liberty to modify according to the situation he faced. Moreover, the Winchman stated at interview that he had understood the baseline sequence from the exercise and he had employed it successfully on a previous SAROP. He also stated his plan to use the correct sequence twice on intercom before leaving the helicopter. The Panel concluded, therefore, that the fact that the baseline sequence of 'strop-connect-cut' was not taught formally to the Winchman was not a factor in the accident. Nevertheless, the Panel noted that although the training support material includes the 'strop-connect-cut'

E20, E27, E28, E29, E52, E73, W2, W7, W10, W16, W17

[59] The 202 Sqn WTO is an experienced instructor, having previously been an instructor on [redacted] both full-time and part-time since [redacted] He is a Qualified Helicopter Crewman Instructor and was last ratified by the Central Flying School on [redacted] (a 2 year qualification (Exhibit 73)) and had served previously as an instructor on [redacted] The Panel concluded that he was suitably qualified and experienced to carry out the training.

[60] The rope-cutting exercise attempts to simulate the rescue of a hung-up climber. The 202 Sqn WTO set himself up on a cliff-face, suspended from a rope with a second safety rope. He was attached to the primary rope with a belay device which was, in turn, attached to his harness by another (blue) rope. This blue rope was the one to be cut by the student winchmen on the exercise, once the strops were in place and connected to the winch hook. The Panel noted that only one rope was to be cut, the winchmen did not have to determine which rope to cut and that permission was required from the WTO (who was acting as the Casualty) before the rope could be cut.

sequence, it is not included in the Instructional Specification (ISpec), which is the formal document covering the delivery of the training. The Panel recommends that the ISpec for Cliff Situations (ISpec C6 – Day Situations 2, dated Oct 12), which includes the rope-cutting exercise, be amended to ensure that the baseline sequence of 'Strops onto the casualty, Connect strops to the hook, Cut' before any ropes or climbing equipment are cut is taught to all winchmen during training.

56. **Fatigue.** The Panel interviewed the crew to determine their activities in the 24 hrs preceding the incident. The Panel also examined the 202 Sqn Operations Log to note their flying activity during the previous shift; while they had flown 3 day sorties on 23 Feb their last landing was at 1940. The pilots flew a 15 min sortie the following morning (24 Feb) before shift handover to confirm that an ac defect had been fixed; they landed at 0855. All 4 crew members then went off-shift until approximately 0830 on 25 Feb. All testified to normal activity and a normal night's sleep. The Panel was satisfied that all crew members were well-rested and fit for duty when they took over duty again on the morning of 25 Feb. There is no evidence that fatigue was a factor in this incident. In particular, there is nothing to indicate that the Winchman's previous shift activities affected his actions, or that the standard '3-shift' pattern was a factor. E8, W1, W2, W3, W5

57. **Communication with the 2nd Climber on-scene.** The Panel considered the communications on-scene between the Winchman and the 2nd Climber. Both reported difficulty in communicating due to the noise and downdraught from the helicopter. Just before cutting the yellow rope, the Winchman attempted to ask the 2nd Climber whether he could cut the ropes, through gestures and shouting. The 2nd Climber could not hear the Winchman, but understood the question to be: 'I have the Casualty, are you okay if I cut the rope?' He assumed that the Casualty had been secured by the Winchman and clearly knew that there were no other climbers in the party. He also considered it obvious that the Winchman would have to cut the Casualty's ropes if he was to airlift him from the mountain. Thus, even if the communications between the 2nd Climber and the Winchman had been perfect, the Panel were of the opinion that the 2nd Climber would have answered 'yes' to the question. Therefore the Panel concluded that the difficulty in communications on-scene between the Winchman and the 2nd Climber was not a factor in the accident. E35, E37, W2, W4

58. **The influence of Overspeed Trip Governor (OTG)[61] incidents.** The Panel considered whether recent Sea King OTG incidents[62] had an influence on the crew's decisions. Specifically, a perception that the risk of engine failure had increased may have affected the Winchman's assessment of the balance between the risk of engine failure and the time the helicopter was attached to the hillside via the winch hook. None of the crew mentioned the risk of OTG failure on intercom during the incident. Only the Co-pilot mentioned a consciousness of the OTG in his testimony, observing that the recent incidents had increased his awareness of the risk of engine failure. For the crew, the risk was not significant enough to prevent them from hovering the helicopter at the minimum permitted distance from the hillside and in a position that would require an aggressive flyaway. As a result, the Panel concluded that the recent OTG incidents were not a factor in this accident. W2, W5, E2, E10,

[61] The OTG is an electronic device designed to prevent serious overspeed of the free turbine of the power generator (this is the part of the engine that converts the engine thrust into torque to drive the rotors). The device senses the speed of the power generator turbine and if this exceeds the equivalent of 122% of the nominal main rotor rpm, the high pressure fuel cock on the corresponding engine is closed, which shuts down the engine.

[62] The OTG has operated incorrectly in-flight in several incidents, the most recent prior to 25 Feb 13 being on 27 Jan 13 and 8 Nov 11. Incorrect OTG operation causes a serviceable engine to shut down unnecessarily. The issue is well-known to the Defence Equipment and Support Sea King Project Team, who are taking ongoing action (Exhibit 79).

Observations arising from the accident

59. **Ease of making inadvertent cuts with the J-knife.** During a Rope-Cutting exercise (Annex B) conducted to assess the potential for inadvertent J-knife cuts during a rescue, the Panel noted the ease with which the J-knife can cut a combination of a 9 mm rope and a webbing strap. The Panel had considered that increased resistance would provide a reasonable, if not compelling, cue to the fact that more than one item was being cut. This was found not to be the case; the cut was as easy to make whether cutting just the rope or the rope plus the strap. The Panel judged that winchmen may make the same assumption as the Panel; that the risk of an inadvertent cut of multiple items would be reduced because of the increased resistance to the cut. The Panel also discovered that it is possible to cut a slack 9 mm rope with a loose end (that is, without having to hold it in any way). The Panel concluded that it would be useful to publicise their findings to the SARF. The Panel recommends that the SARF Commander review the training delivered to SAR crews to ensure that the ease and speed with which 9 mm ropes and webbing can be cut using a J-knife is highlighted. E62, Annex B

60. **Difficulty in cutting 12 mm rope with the J-knife.** During the Rope-Cutting exercise described at Annex B, the Panel observed that while it was very easy to cut 9 mm climbing rope it was more difficult to cut 12 mm rope. The rope was too wide to fit easily through the jaws of the J-knife; the knife had to be pulled quite hard to squeeze the rope through. This difficulty would increase were the rope to be wet or icy. If a winchman has difficulty cutting ropes then the time during which the helicopter is attached to the hillside will increase, which increases the risk of an accident in the event of a flyaway. Twelve mm-diameter rope, while less popular amongst the climbing fraternity, is another standard climbing rope size. The J-knife is designed primarily for cutting parachute cords or harnesses when rescuing downed aircrew, but given that a significant proportion of SARF tasking is devoted to the rescue of civilian personnel, the Panel concluded that it would be prudent for the J-knife design to accommodate the requirements of those missions. This is particularly pertinent when time-at-risk during rope cutting operations is a factor, as it was in this accident. The Panel recommends that the SARF Commander review the need to increase the size of the opening on the J-knife to allow easy cutting of standard diameter climbing ropes (up to 12 mm). E62, Annex B

61. **The Winchman's selection.** The Panel investigated how the Winchman came to be selected. In essence, he was selected on the basis of previous reputation among members of the RAF SARF. [redacted] While there is nothing to suggest that the Winchman's selection was inappropriate, in failing to check thoroughly the individual's recent employment background the Service left itself open to risk. The Panel concluded that neither the SARF nor HQ Air [redacted] completed a comprehensive check of the Winchman's suitability for employment; neither were the procedures detailed in Air Command instructions for the employment of [redacted] personnel followed rigorously enough. The Panel recommends that the SARF Commander and HQ Air [redacted] ensure that the appropriate Air Command instructions for the recruitment of SAR [redacted] personnel are followed. W6, W8 W11, W13

62. **Qualification of the WTO to conduct rope-cutting exercises.** 203(R) Sqn orders require those delivering training in rope-cutting to be specifically qualified to do so. In particular, they are required to be trained by a 203(R) Sqn RTO and a record of that E65, E81

[redacted]

training is to be held in the individual's training folder. No equivalent regulation exists in SARF Orders to cover rope-cutting training conducted outside the 203(R) Sqn supervisory chain. The Panel was unable to obtain any record of rope-cutting training for the 202 Sqn WTO. Investigation revealed that the Sqn WTOs do undergo training prior to conducting rope-cutting exercises but the training is on a local, ad-hoc basis and may not always meet the requirements of the 203(R) Sqn order. The training required by the 203(R) Sqn orders does not affect the content of the rope-cutting exercise but is designed to ensure the safety of the participants; as such, it did not affect either the accident or the Panel's judgement that the 202 Sqn WTO was suitably-qualified and competent to deliver the training to the Winchman. The Panel concluded that the rope-cutting qualification and associated training should be mandatory for any instructor conducting a rope-cutting exercise. The Panel recommends that the SARF Orders be amended to make a rope-cutting qualification and associated training mandatory for any instructor conducting a rope-cutting exercise.

63. **Post-incident management.** The Panel investigated the management of the incident after the accident and the factors affecting the availability of evidence to the SI. There were 4 issues worthy of note: E2, E33, E56, E57, E58, E59, E65, W6, W13

a. **Failure to reset the FLIR video tape.** Imagery from the FLIR camera is recorded on a 3 hr tape, the controls for which are at the RadOp's position. The RadOp stated that he noticed that the light indicating that the tape had run out was illuminated when the ac went to refuel after the accident. This was the first time that he had noticed. If the tape had been rewound and restarted before the incident then more evidence would have been available to the Panel. The Panel recommends that a check that the FLIR video tape has been reset be incorporated into the appropriate checklist to ensure optimal recording of SAROPs.

b. **Failure to set the FLIR to STOW during the transit.** The Panel's attempts to deduce the rope systems from the FLIR imagery were hampered by areas of obscuration on the FLIR lens caused by debris collected during the transit between RAF Lossiemouth and the scene of the accident. It was noted that the FLIR camera was forward-facing rather than stowed for the majority of the transit flight; contrary to SARF SOPs[64]. The Panel judged that the FLIR camera was not specifically required during most of the transit flight and that if the SOP had been complied with then the FLIR imagery of the accident scene might have been less distorted. The Panel recommends that RadOps be reminded of the SOP requirement to set the STAR Q to STOW unless it is *specifically required*.

c. **Failure to isolate the CVFDR.** The CB for the CVFDR was not tripped by the crew for the flight after the accident (see Part 1.3 para 32). This meant that the recording of the accident was overwritten by the events of the next flight[65]. This recording was provided to the Panel but contained no relevant information. The Panel investigated recovering the data but this was not possible. While there is an explanation for the fact that the CB for the CVFDR was not tripped, it has nevertheless potentially deprived the Inquiry of evidence. The Panel examined the SARF Crash and Major Injury Action Plan and the 202 Sqn D Flt Crash Orders and

[64] RAF SAR Force SOPs Sea King Mk 3 & Mk3A Edition 2 Chapter 32 states 'if the STAR Q is not specifically in use during flight, it should be switched on, but left at STOW. This will prevent the lens from becoming contaminated with animal debris (flies, etc.), which, in addition to interfering with the visual clarity of the TI and TV pictures, can damage the lens over a period of time.'

[65] The CVFDR has an electronic recording device that records all ac audio over the previous hour. The data is on a continuous loop, however, and is continuously overwritten. After the accident flight, the CB to the CVFDR was not tripped so that the CVFDR continued to run and recorded the ac's flight back from Lochaber Base to RAF Lossiemouth. Once there, the ac batteries were left on while the ac was refuelled. As a result, the whole of the recording from the accident flight was overwritten. The Panel investigated whether the recording could be recovered but the manufacturer stated that this was not possible (Exhibit 65).

noted that the SAR Force Plan contained a Master Incident Checklist (MIC) at Appendix 1 to Annex C, which is to be completed by the Duty SAR Officer (DSARO) at SARF HQ. This checklist is duplicated in the D Flt Crash Orders. However, the MIC does not include a check that the CVFDR has been impounded. The SAR Force Plan also includes a Detached Units Action Checklist (DUAC), with an Appendix listing documents to be impounded, again duplicated in the D Flt Crash Orders. The DUAC does not include a check that the CVFDR has been impounded, although there is a check that "Electronic Recording Tapes and Data Storage Media incl FLIR" are held. While the lack of a clear check to impound the CVFDR did not cause OC D Flt to forget it, such a check may help in future incidents. The Panel recommends that the SARF Commander review the Crash and Major Injury Action Plan (and the 202 Sqn D Flt Crash Orders) to ensure the protection of CVFDR data.

d. **Crew debrief before SI interviews**. The command chain conducted 2 interviews with the crew; one by telephone just before the Police interviews and a second after their recovery to RAF Lossiemouth. Episodic memory, that which includes our memory about specific events, is known to be fragile. Inviting recollection through unstructured interviews with personnel in the command chain and in combination with other crew members can significantly alter recollection of events. Since accident investigation may depend on an unaffected recollection, it is essential that interviews and intra-crew discussion prior to a SI be minimised, noting that the Police may have primacy. The Panel recommends that guidance be provided to all command chains not to interview potential SI witnesses until permitted by the SI President. Equally, witnesses must not be allowed to consult with each other prior to SI interviews; unless there is an over-riding Flight Safety issue.

64. **Appointment of a Visiting Officer.** Units receive notification and authority to appoint a Visiting Officer (VO) for the Next of Kin (NOK) of deceased personnel from the Joint Casualty and Compassionate Centre (JCCC). The guidance for the JCCC's action is provided in JSP 751. In this instance, the deceased, who was a civilian, did not meet the eligibility criteria for a VO to be appointed (JSP 751, para 02.01.0103). As a result, no units were required to provide a VO to the NOK. This meant that the first RAF representative that the NOK met was the SI President, some 8 days after the accident. The Panel considered that it was unacceptable that when a civilian is killed in association with a military activity, no VO or liaison officer is appointed. Since the JCCC acted correctly, the Panel recommends that Chief of Staff Personnel (COS Pers) review the existing policy regarding the appointment of liaison officers to civilian NOK through Community Support at HQ Air Command. E82

65. **J-knife stowage.** The winchman J-knife is normally stowed in a valise attached to a D-ring on the chest of the life preserver. The Additional Analysis HF Report (Annex E para 11) identified that this stowage may be less than ideal. During SAROPs winchmen typically withdraw the J-knife from its valise, to which it is attached by a lanyard, then stow it between uses in the thigh or leg pockets. The HF Report notes that this movement of the J-knife from the chest location to another stowage position could in certain circumstances involve movement of the knife past a casualty and any associated ropes; thereby increasing the likelihood of an inadvertent cut. The Panel recommends that the SARF Commander consider the relocation of the J-knife stowage from the chest area to a more convenient position, such that unnecessary knife movements are minimised. Annex E

66. **Adherence to J-knife maintenance policy.** Support Authority General Orders for Survival Equipment[66] requires winchmen to return J-knifes to the relevant Survival Equipment Section for servicing post use or immersion in salt water; a policy designed to ensure the efficiency of the J-knife during any subsequent SAROPs. Whilst the Panel noted that a number of factors could preclude a winchman from complying immediately with this policy post a SAROP[67], there is evidence that J-knife maintenance policy may not be rigorously followed by all winchmen. Consequently, the Panel recommends that winchmen be reminded of the importance of adhering to the extant J-knife maintenance policy. E86, W4

Health and Safety at Work implications

67. The Panel investigated the Health and Safety at Work implications in line with JSP 375 and confirmed that the relevant policy requirements had been met. Although RAF Lossiemouth did not complete a 'RIDDOR' (in accordance with the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995), the Health and Safety Executive (HSE) was informed by the Police that the accident had occurred and information was forwarded to them for consideration. A separate HSE investigation is on-going although the Panel did not identify any specific Health and Safety at Work issues. However, the Panel was obliged by JSP 375 to investigate whether the MOD had been operating within the Law; in the process identifying a 'grey area' brought about by differences between the Work at Height Regulations 2005 and the more recent Work at Height (Amendment) Regulations 2007, and its applicability to SAR helicopter operations, particularly in the training environment. The Panel attempted to determine, through discussion with SARF HQ and SAR STANEVAL, what work had been completed to ensure compliance with the legislation. However, the SARF was unable to provide evidence of a proper check for compliance in flying operations. The Panel recommends that the SARF Commander consider the requirements of the Work at Height Regulations 2005 and Work at Height (Amendment) Regulations 2007 to ensure that SAR helicopter operations are either compliant or exempt. E55, E77, E80

Environmental Protection implications

68. The Panel investigated the Environmental Protection implications in line with JSP 375 with the assistance of the Operations Manager of the Environmental & Industrial Hazards Support Group at the Institute of Naval Medicine. The Panel concluded that the environmental impact of the incident was minimal and that no environmental recovery actions were required. E67

SI administration

69. The SI was not allocated a MilAAIB Advisor at the start of the investigation. Later, the President requested that one be allocated as JSP 832 lacks practical guidance. The Advisor was able to provide excellent subject matter expertise, both in terms of investigational analysis and for staffing the final report. The Panel concluded that it would be prudent to ensure that MilAAIB expertise be provided to any air-related SI Panel. The Panel recommends that MilAAIB Advice be provided to all air-related SI Panels, regardless of the Convening Authority.

[66] DAP 108A-0006-2(N/A/R)1 Support Policy for Airborne Search & Rescue Equipment: Issue 12 (Chapter 6.1, Section 5, Paras 5.1 to 5.16).
[67] Most notably concurrent SAROPs.

PART 1.5 - RECOMMENDATIONS

Number	Recommendation	Para Ref	Action
1	The Panel recommends that the SARF introduce a SOP for hung-up casualties[1], to include the baseline sequence of 'Strops onto the casualty, Connect strops to the hook, Cut'. The strops must be connected to the winch hook before any ropes or climbing equipment is cut. This applies at any time where a casualty could be at risk of a fall to further harm (noting that this does not apply exclusively to mountaineering situations).	41	SAR STANEVAL
2	The Panel recommends that the SARF balance the emphasis placed by winchmen on the risk of attaching the helicopter to the hillside during winching operations, with the other risks the situation may present. This should be applied to both initial training and continuation training.	44	203(R) Sqn, SAR STANEVAL
3	The Panel recommends that SARF implement training on the management of risks associated with the moral obligation to rescue[2] and the requirement for winchmen to consult with the crew if the situation is radically different from that assumed before they left the helicopter. RAF CAM should be consulted to review such training against the latest practice in this area. This should be applied to both initial training and continuation training.	47	203(R) Sqn, SAR STANEVAL
4	The Panel recommends that the SARF compile a standard aide-memoir of informant questions for use during radio and 'Airwave' calls. This should include, for example, asking for the number of members in the party, the clothing they are wearing, whether they have any locations aids, and a description of their exact location.	48	SAR STANEVAL
5	The Panel recommends that the SARF remind all winchmen that although climbers, or similar casualties in technical situations, may be experts in their field, their understanding of the rescue situation may be limited. The survivor may also have a misunderstanding of the situation. The winchman must conduct his own assessment before taking a critical action.	49	SAR STANEVAL
6	The Panel recommends that the SOP governing the use of the 'Airwave' system be amended to encourage more than one crew member to engage in critical calls to informants, as opposed to channelling the crew down the line of only one crew member engaging. It is possible for both rearcrew to listen to Airwave while not distracting the pilots.	53	SAR STANEVAL
7	The Panel recommends that the ISpec for Cliff Situations (ISpec C6 – Day Situations 2, dated Oct 12), which includes the rope-cutting exercise, be amended to ensure that the baseline sequence of 'Strops onto the casualty, Connect strops to the hook, Cut' before any ropes or climbing equipment are cut is taught to all winchmen during training.	55	203(R) Sqn

[1] The term 'casualties' is preferred to 'climbers', since the casualty may be suspended from a rope system in non-climbing situations, for example, rope access systems on tall buildings.
[2] The 2 key risks are that the winchman might take on more risk during the rescue than the crew would be comfortable with, and that the winchman might feel obliged to make a rescue that is beyond his technical ability.

Number	Recommendation	Para Ref	Action
8	The Panel recommends that the SARF Commander review the training delivered to SAR crews to ensure that the ease and speed with which 9 mm ropes and webbing can be cut using a J-knife is highlighted.	59	SARF Commander
9	The Panel recommends that the SARF Commander review the need to increase the size of the opening on the J-knife to allow easy cutting of standard diameter climbing ropes (up to 12 mm).	60	SARF Commander
10	The Panel recommends that the SARF Commander and HQ Air [redacted] ensure that the appropriate Air Command instructions for the recruitment of SAR [redacted] personnel are followed.	61	HQ Air [redacted] SARF Commander
11	The Panel recommends that the SARF Orders be amended to make a rope-cutting qualification and associated training mandatory for any instructor conducting a rope-cutting exercise.	62	SARF Commander
12	The Panel recommends that a check that the FLIR video tape has been reset be incorporated into the appropriate checklist to ensure optimal recording of SAROPs.	63	SAR STANEVAL
13	The Panel recommends that RadOps be reminded of the SOP requirement to set the STAR Q to STOW unless it is *specifically required.*	63	SAR STANEVAL
14	The Panel recommends that the SARF Commander review the Crash and Major Injury Action Plan (and the 202 Sqn D Flt Crash Orders) to ensure the protection of CVFDR data.	63	SARF Commander
15	The Panel recommends that guidance be provided to all command chains not to interview potential SI witnesses until permitted by the SI President. Equally, witnesses must not be allowed to consult with each other prior to SI interviews; unless there is an over-riding Flight Safety issue.	63	MiLAAIB
16	The Panel recommends that COS Pers review the existing policy regarding the appointment of liaison officers to civilian NOK through Community Support at HQ Air Command.	64	COS Pers
17	The Panel recommends that the SARF Commander consider the relocation of the J-knife stowage from the chest area to a more convenient position, such that unnecessary knife movements are minimised.	65	SARF Commander
18	The Panel recommends that winchmen be reminded of the importance of adhering to the extant J-knife maintenance policy.	66	SAR STANEVAL
19	The Panel recommends that the SARF Commander consider the requirements of the Work at Height Regulations 2005 and Work at Height (Amendment) Regulations 2007 to ensure that SAR helicopter operations are either compliant or exempt.	67	SARF Commander
20	The Panel recommends that MilAAIB Advice be provided to all air-related SI Panels, regardless of the Convening Authority.	69	AOC 2 Gp

SERVICE INQUIRY REPORT INTO THE CIRCUMSTANCES SURROUNDING THE DEATH OF A CIVILIAN CLIMBER DURING RESCUE 137 ON 25 FEB 13

CONVENING AUTHORITY COMMENTS

1. This is a thorough and diligently researched Service Inquiry (SI) and I am grateful to the President and the SI Panel for their detailed analysis of the evidence to investigate fully the tragic death of a civilian climber during Rescue 137 on 23 Feb 13. As Convening Officer, I would like to extend my deepest sympathy to the family and friends of the climber who tragically lost his life. I am content that the SI Panel have fulfilled their Terms of Reference and I concur with the Summary of Findings and the recommendations that the SI Panel have made.

2. I am satisfied that the SI Panel have correctly identified the cause of this accident. This was the severance of both ropes during the rescue attempt without having the casualty restrained in the strops and the strops attached to the winch hook prior to the ropes being cut. Although it cannot with certainty be determined how or when the blue rope was severed, on the balance of probabilities, I judge that the blue rope was cut by the winchman using his J knife. I accept that he clearly believed that the casualty was still restrained by the blue rope when he made the decision to cut the yellow rope and this was, therefore, a tragic accident.

3. In an effort to understand what confronted this highly experienced winchman, I had the SI Panel reconstruct the rope layout. This reinforced to me that the scenario that faced him on the mountain side was extremely complex and messy. This complexity contributed to his amending his original plan (and the extant guidance and training) of putting the strops on the casualty, connecting the strops to the hook and then cutting **all** of the ropes. Instead he decided not to attach the casualty to the hook until the last supporting rope was left in an effort to minimise the risk by time that the helicopter was fixed to the rock face by the casualty. I am also acutely aware that the winchman was the only person to be able to accurately assess the clinical state of the casualty and the need to get on with the rescue; hence the decision not to deploy the Mountain Rescue Team from Loch Aber.

4. Immediately after it became clear what had happened, I directed that the extant guidance was to be made Standard Operating Procedure and that if the risk to the helicopter and crew could not be adequately balanced against the obligation to rescue then a SAR rescue was not to be attempted. All of this has been subsequently reinforced in both conversion and continuation training for all RAF SAR winchmen.

5. Turning to the recommendations, and noting that many of them are already complete, I direct that the SAR Force Commander is to ensure that, in conjunction with the RAF Safety Centre, all of the recommendations are either actioned or dispensed with by the appropriate body. Finally, given the complexity of the incident, I agree that the President of the SI Panel, [redacted] should ideally present the findings of the panel to [redacted]

[redacted]

S K P REYNOLDS
AVM
AOC 2 Gp

1 May 14

SERVICE INQUIRY REPORT INTO THE CIRCUMSTANCES SURROUNDING THE DEATH OF A CIVILIAN CLIMBER DURING RESCUE 137 ON 25 FEB 13 ON THE BEN NEVIS MOUNTAIN RANGE, SCOTLAND

Reviewing Authority Comments:

1. The board has conducted a very thorough investigation, which has been constrained by the lack of firm evidence of the exact state of the casualty and his ropes, other than the witness statements and observations of the SAR Winchman. The ultimate tragic outcome demonstrates just how hazardous such operations can be. I too offer the families and loved ones of the deceased my most sincere condolences on behalf of the Royal Air Force. The sequence of events boil down to three elements: the decision to conduct the rescue from the helicopter, the decision to not attach the strops to the hook, and the circumstances in which the blue rope came to be cut.

2. Firstly, I believe that the SAR crew made all the correct judgements and decisions as they weighed up the options for conducting the rescue or using the MRT. I also accept that, once the Winchman had made contact with the casualty and assessed his situation, he made a judgement call that cannot be second guessed. Whilst he may have felt some pressure to complete the task, it was within the capability of the crew and was clearly the quickest way to recover the casualty. Time remaining on task may have been a factor in making a quick decision but his over-riding concern would have been for the welfare of the casualty.

3. This experienced Winchman was fully cognisant of the "strop-hook-cut" principle as evidenced by his statement at the time that this was his intended course of action. The complex picture of ropes and rucksack that faced him clearly influenced his decision to modify this approach, and his concern over the time he might spend with the helicopter "attached" to the rock face was clearly a factor. On balance, I think the Board's recommendation to reinforce the "strop-hook-cut" approach is entirely correct and that the limited time required to cut ropes is an acceptable risk to take when balancing the risk to the helicopter and crew and the safety of the casualty during a rescue. However, it is clear that such actions require a high degree of courage from the Winchman in particular and we should respect that fact and the reason why he modified his approach in this case. Knowing that he had not attached the strops to the hook he was taking significant care to ensure that he did not endanger the casualty or just as importantly, the other climber.

4. I believe that the Winchman's subsequent actions were made in the full knowledge that he had not hooked up the strops; however, what is clear is that the blue rope was cut, although we will never know how and when for sure. I accept that the evidence that the cut was caused by the J knife is strong, but not conclusive. The act of cutting the rucksack away produced the potential for this to happen by accident, and I am drawn to the observation of the coincident falling away of metal objects at the same time (para 21 of part 3) but there are other, although less likely possibilities.

5. The situation that faced the Winchman required a number of subjective judgements to be made in a relatively hazardous and complex scenario. He could have made the easy and entirely reasonable call to pass the rescue to the MRT, but having regard to the casualty's apparent physical condition and position, we will never know if this would have endangered his safe recovery. What I consider is clear is that his decision to attempt the rescue required a high degree of courage, as all such rescues do, and he was focussed on doing everything he could to effect a safe rescue. My aim as the Reviewing Authority is to ensure that as far as practicable there is no

repetition of this tragic outcome and in that I support all the Board's recommendations, including emphasis of the correct sequences and explanation of the potential risks to the helicopter and crew of the technique. In addition to the Board's recommendations, I direct the SAR Force to look at the possibility of Winchmen using helmet cams as both a teaching aid and an additional evidential tool, and to review their SOPs on how SAR crews can build their situational awareness with other climbers, through physical interaction.

6. It is easy to speculate that had different procedures been followed, there would, in all likelihood, have been at the very least a successful recovery of the injured climber to the helicopter. However, I believe that the Winchman made his decisions based on the best of intentions and with a difficult balance of risk between the safety of the helicopter, its crew, the casualty and, not least, himself. Regrettably, the accidental cutting of the blue rope, however that occurred, resulted in the tragic loss of a climber for whom the Winchman was ready to take considerable risk to rescue. Those who have never dangled against a cliff face on a 150 foot wire underneath a 10 tonne SAR helicopter, all to save a person they have never met, should factor that into their judgement.

[redacted]

Air Marshal
G J Bagwell
DCom Ops

May 14