



Defence
Safety
Authority

Service Inquiry

Death of a Soldier
Participating in Live Fire
Tactical Training at Heely
Dodd Range, Otterburn

22 Aug 16

Defence Safety
Authority

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PART 1.1 – COVERING NOTE

DSA DG/SI/03/15

18 Jul 17

DG DSA

SERVICE INQUIRY INTO THE DEATH OF PTE MCPHERSON DURING A LIVE FIRE TACTICAL TRAINING (LFTT) AT OTTERBURN TRAINING AREA ON 22 AUG 16

1. The Service Inquiry Panel assembled at MoD Abbey Wood, on the 30 Aug 16 by order of the DG DSA for the purpose of investigating the death of Pte McPherson during a LFTT exercise at Heely Dod Range, Oterburn training area on 22 Aug 16 and to make recommendations in order to prevent recurrence. The Panel has concluded its inquiries and submits the provisional report for the Convening Authority's consideration.

PRESIDENT

[REDACTED]

President
Service Inquiry

MEMBERS

[REDACTED]

Board Member
Service Inquiry

[REDACTED]

Board Member
Service Inquiry

2. The following inquiry papers are enclosed:

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

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

OFFICIAL SENSITIVE**PART 1.1 GLOSSARY**

Acronym/Abbreviation	Explanation
3 SCOTS	3 rd Battalion The Royal Regiment of Scotland
51 Bde	51 Brigade
AAR	After Action Review
AIB	Accident Investigation Branch
ACSSU	Air Combat Service Support Unit (Photographic Operations)
Ammo	Ammunition
Bayonet	A knife mounted on a weapon
BG	Battle Group
BFA	Battle Field Ambulance
Bn	Battalion
Bn HQ	Battalion Head Quarters
CD Cbt	Capability Directorate Combat
CIC	Combat Infantry Course
CO	Commanding Officer
CoC	Chain of Command
Company (Coy)	A Company consist of 3 Platoons and a Headquarters (HQ) consisting of approximately 90 men
CWS	Common Weapons Sight
Cpl	Corporal
CMT	Combat Medical Technician
CSM	Company Sergeant Major
CT3	Command Training level 3
CQB	Close Quarters Battle
CYALUME	Light emitting plastic tube, disposable
Defence AIB	Defence Accident Investigation Branch
DCC	Dismounted Close Combat
DE&S	Defence Equipment and Support
DG	Director General
DI	Detective Inspector
DIO	Defence Infrastructure Organisation
DLE	Defence Learning Environment
DPers Cap	Directorate of Personnel, Capability
DSA	Defence Safety Authority
DSTL	Defence Science Technology Laboratories
ETR	Electronic Target Range
Ex Dir	Exercise Director
Ex WS	Exercise Wessex Storm
F&M	Fire and Manoeuvre
FCO	Fire Control Order
FOE	Forecast of Events
FOXHOUND	Light Protected Patrol Vehicle
FT	Fire Team
FTA	Fire Team Attack
FTC	Fire Team Commander
FTU	Field Training Unit
Gp	Group
HF	Human Factors

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HoC Cbt	Head of Capability, Combat
HMNVS	Head Mounted Night Vision System
HUSKY	A protected support vehicle
HQ	Headquarters
IBS	Infantry Battle School
Inf Bn	Infantry Battalion
IR	Infra-Red
ISTAR	Intelligence Surveillance Target Acquisition Reconnaissance
ITC	Infantry Training Centre
JOTAC	Junior Officers Tactical Awareness Course
LCpl	Lance Corporal
Leaguer	Temporary tactical vehicle park
LFTT	Live Fire Tactical Training
Lt	Lieutenant
Lt Col	Lieutenant Colonel
Lt Mech	Light Mechanised
LLM MK3	Laser Light Module, Mark 3
LM	Lockheed Martin
LNV	Limit of Night Visibility
LUCIE	Universal Night Vision Goggle
NVD	Night Vision Device
NVG	Night Vision Goggle
NLAW	Next Generation Light Anti-tank Weapon
OPFOR	Opposing Force
OSP	Operational Shooting Policy
OTA	Otterburn Training Area
Pam 21	Pamphlet 21
PI	Platoon
PCBC	Platoon Commanders Battle Course (PCBC)
PRR	Personal Role Radio
Pte	Private
RAF Halton	RAF Halton
RASP	Range Action Safety Plan
RCO	Range Conducting Officer
RDA Trace	Range Danger Area Trace
RE	Royal Engineers
Recce	Reconnaissance
RMO	Regimental Medical Officer
SA80 (L85A2)	SA80 (L85A2), Current in service rifle
RWMIK	Revised Weapons Mounted Installation Kit
SA(A)(90)	SA(A)(90) range qualification
SA(E)(90)	SA(E)(90) range qualification
SARTS	Small Arms Range Targetry System
SASC	Small Arms School Corps
SECR	Safety and Environmental Case Report
Sect	Section
Sgt	Sergeant
SI	Service Inquiry
SIB	Special Investigation Branch
SIO	Senior Investigating Officer
SPTA	Salisbury Plain Training Area

1.1 - 3

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SME	Subject Matter Expert
SMI	Sergeant Major Instructor
SPO	Senior Planning Officer
SS	Safety Supervisor
TAB	Tactical Advance to Battle
TAS	Technical Advisory Section
TO	Target Operator
TOR	Terms of Reference
THPS (BU)	Tactical Hearing Protection Basic User
TES	Tactical Engagement Simulation
TESEX	Tactical Engagement Simulation Exercise
TI	Thermal Imaging
UGL	Under slung Grenade Launcher
VIPER	Thermal Imaging Sight
Webbing	Fighting Order
ZERO	Zeroing of weapons

Glossary of Terms

#

3rd Battalion The Royal Regiment of Scotland, (3 SCOTS), an infantry regiment in the British Army.

51 Brigade (51Bde), 51st Infantry Brigade and Headquarters Scotland (formerly 51 (Scottish) Brigade).

A

After Action Review (AAR), is a simple process used to capture the lessons learned from the past LFTT activities, with the goal of improving future performance.

Accident Investigation Branch (AIB), the Defence body charged with investigating accidents.

Air Combat Service Support Unit (Photographic Operations) (ACSSU), a photographic team from a support unit with the Royal Air Force.

Ammunition (Ammo), is the general term used for the material fired, scattered, dropped or detonated from any weapon.

B

Barry Buddon, is a MOD owned rifle range and training area located in Barry, Angus, Scotland.

Bayonet (from French baïonnette) is a bladed weapon such as a knife or short sword, designed to fit in, on, over or underneath the muzzle of a rifle, increasing the weapon, as a spear. In this regard, it is an ancillary close-quarter combat or last-resort weapon.

Battalion (Bn), is a military unit in the British Army consisting of 500 to 700 soldiers and is divided into a number of companies.

Battalion Head Quarters (Bn HQ), The Higher command element of an entire Battalion.

Battle Group (BG), An Infantry Battalion (Inf Bn) with attached arms soldiers and equipment.

Battle Field Ambulance (BFA), a military ambulance.

C

Capability Directorate Combat (CD Cbt), 1 of the 4 directorates in Army HQ.

Chain of Command (CoC), the line of authority and responsibility along which orders are passed within the military.

Combat Infantry Course (CIC), training course of 26 week duration.

Combined Arms Live Firing Exercise (CALFEX), a major exercise involving live firing up to Battalion level.

Combat Medical Technician (CMT), a soldier with a specialist military trade within the Royal Army Medical Corps of the British Army is capable of assisting with the management of surgical, medical and psychiatric casualties from the onset of the condition until the casualty is admitted to a hospital offering specialist care.

Commanding Officer (CO), officer in charge of a battalion, normally Lt Col.

Command Training level (CT3), multiple sub-units (Coy level) training in a task organised unit or combined arms BG context.

Common Weapons Sight (CWS), a night sight used with most infantry small arms, which intensifies images in the IR Spectrum.

Close Quarters Battle (CQB), a tactical concept that involves physical confrontation between several combatants.

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Company (Coy), consists of 3 Platoons (PL) and a Headquarters (HQ) consisting of approximately 90 men.

Company Sergeant Major (CSM), a warrant officer with a company.

Corporal (Cpl), a junior non-commissioned officer in command of 6-10 men.

CYALUME, light emitting plastic tube, disposable, a device used to emit light in a tactical or training environment to mark soldiers or areas.

D

Defence Accident Investigation Branch (Defence AIB), the Defence body charged with investigating accidents, and forms part of the DSA.

Defence Equipment and Support (DE&S), a bespoke trading entity of the Ministry of Defence that manages projects to buy and support all the equipment and services for the MOD.

Dismounted Close Combat (DCC), infantry soldiers operating on foot.

Director General (DG), a high ranking military officer who commands the DSA.

Detective Inspector (DI), a position within UK police.

Defence Infrastructure Organisation (DIO), is the operating arm of the Ministry of Defence (MOD), in the United Kingdom, which is responsible for the built and rural estate.

Defence Learning Environment (DLE), is an internet-based platform for the digital aspects of courses of study.

Directorate of Personnel, Capability (DPers Cap), a directorate responsible for Army welfare, wellbeing and living.

Defence Safety Authority (DSA), the Defence Safety Authority is an independent organisation, within the MOD, empowered by charter from the Secretary of State for Defence to undertake the roles of regulator, accident investigation and Defence Authority for safety of a military body controlling all service inquiries.

Defence Science Technology Laboratories (DSTL), a government body that tests and evaluate kit and equipment etc.

E

Electronic target Range (ETR), a static firing range that utilises targets that operate electronically via wired connections in the ground.

Exercise Director (Ex Dir), normally the CO, responsible for appointing SPOs' ensuring they have appropriate rank, qualification and experience to support training.

Exercise Wessex Storm (Ex WS), is a field training exercise consisting of both live and simulation firing.

F

Fire and Manoeuvre (F&M), a tactic utilised by soldiers to close with and defeat an enemy.

Fire Control Order (FCO), is given (in a specific sequence) so that the soldier can recognize the target and fire at it effectively.

Forecast of Events (FOE), an estimate or prediction of a units training or operational calendar.

Fire Team (FT), a group of soldiers numbering between 3 and 5.

Fire Team Attack (FTA), an assault onto an enemy position by a fire team.

Fire Team Commander (FTC), a soldier (usually a non-commissioned officer) with direct responsibility over a fire team.

Field Training Unit (FTU), team of subject matter experts that assist, direct and mentor units on major exercises.

FOXHOUND, a Light Protected Patrol Vehicle.

G

Group (Gp), unspecified number of personnel.

H

Human Factors (HF), the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize **human** well-being and overall system performance.

Head of Capability, Combat (HoC Cbt), a formation working under a directorate that is there to drive Mounted and Dismounted Close Combat capability development and delivery.

Head Mounted Night Vision System (HMNVS), a system that, when worn, allows soldiers to see at night in the infra-red spectrum.

Headquarters (HQ), the command and control element of a military unit.

HUSKY, a protected support vehicle, providing a highly mobile and flexible load carrying vehicle.

I

Infantry Battle School (IBS), a training unit in Brecon, South Wales.

Infantry Battalion (Inf Bn), a military unit of approximately 500 soldiers.

Infra-Red (IR), light is the part of the electromagnetic spectrum encountered in everyday life.

Intelligence Surveillance Target Acquisition Reconnaissance (ISTAR), a practice that links several battlefield functions together to assist a combat force in employing its sensors and managing the information they gather.

Infantry Training Centre (ITC), Catterick, a Training depot in Yorkshire.

J

Junior Officers Tactical Awareness Course (JOTAC), a course to prepare Army Officers for promotion to Captain.

K

Kirkcudbright, a training area in south west Scotland.

L

Landmarc, A MOD contractor primarily employed within the Support Services Group area.

Lance Corporal (LCpl), the first non-commissioned rank in the army commanding 3-5 men.

Leaguer, a temporary military camp formed by vehicles.

Lieutenant Colonel (Lt Col), Commissioned rank commanding 500 soldiers.

Limit of Night Visibility (LNV) shoot, night shooting requirement for all service personnel to fire at the LNV using the optic sight or by instinctive pointing of the ironsight.

Live Fire Tactical Training (LFTT), exercises that provide training in a realistic setting on areas to train soldiers in all the skills and procedure for operations.

Light Mechanised (Lt Mech) Conversion, from a basic infantry unit to an infantry unit equipped with protected mobility fleet vehicles for transport and combat.

Lieutenant (Lt or 2Lt), officer rank in the British Army in command of a platoon.

Laser Light Module, Mark 3 (LLM MK3), a device fitted to a rifle that when collimated allows the operator to mark targets in the IR and visible spectrum to allow for accurate shoulder controlled aimed shots.

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Lockheed Martin (LM), is an American global aerospace, defence, security and advanced technologies company with worldwide interests.

LUCIE, Universal Night Vision Goggle used by drivers.

N

Night Vision Device (NVD), is a collective term for any optoelectronic device that allows images to be produced in levels of light approaching total darkness

Night Vision Goggle (NVG), equipment that allows soldiers to see at night, which utilise and intensify ambient light.

Next Generation Light Anti-Tank Weapon (NLAW), a weapon capable of launching a rocket-propelled projectile.

O

Operational Shooting Policy (OSP), a training manual that provides direction for the regime of shoots designed to train soldiers for operations.

Opposing Force, a group of soldiers acting as enemy to create a realistic exercise for the supported battle group.

Otterburn Training Area (OTA), a training area in Northumbria.

P

Pamphlet 21 (Pam 21), are the training regulations for armoured fighting vehicles, Infantry weapon systems and pyrotechnics when conducting any firing.

Platoon (PI), is a group consisting of up to 28 men in 3 sections with a small headquarters (HQ).

Platoon Commanders Battle Course (PCBC), infantry officers' course run at IBS.

Personal Role Radio (PRR), an Ultra High Frequency (UHF) transmitter-receiver radio issued to the British Armed Forces, used by soldiers to communicate with each other individually.

Private (Pte), the basic rank in the Army.

R

RAF Halton, a station of No 22 (Training) Group and part of the Directorate of Recruitment and Initial Training located near London.

Range Action Safety Plan (RASP), a mandatory document produced for all Live Firing Tactical Training.

Range Conducting Officer (RCO), responsible for the safe conduct of firing in accordance with the plan.

Range Danger Area (RDA) Trace, is a technical drawing of an amalgamation of Weapon Danger Area (WDA) templates worked to a given scale and produced on appropriate material for convenient application to a map.

Reconnaissance (Recce), in this case a vital part of the planning process where the RCO is to visit the range to plan the LF activity, ensure all safety aspects are considered, ensure local Standing Orders are followed and consult with Range Control reference facility and target availability.

Reveille, is the time soldiers get up in the morning (traditionally to the sound of a bugle).

Regimental Medical Officer (RMO), a military doctor with the rank of Major, responsible for the medical welfare of a battalion.

Revised Weapons Mounted Installation Kit (RWMIK), is a lightly armoured, highly mobile fire support and force protection Land Rover.

Royal Engineers (RE), a military unit that provides military engineering and other technical support to the British Armed Forces.

S

SA80 (L85A2), current in service rifle.

SA(A)(90) qualification, range qualification category that allows individuals to plan, conduct and supervise all live firing with Infantry weapon systems and pyrotechnics.

SA(B)(90) qualification, range qualification category that allows individuals to act as a safety supervisor during all live firing tactical training.

Sergeant Major Instructor, an Army Warrant Officer who directs safety procedures on all live firing ranges.

Small Arms Range Targetry System (SARTS), is the latest electronic target systems now used within the UK.

Small Arms School Corps (SASC), is a small corps of the British Army, responsible for maintaining the proficiency of the army in the use of small arms, support weapons and range management.

Safety and Environmental Case Report (SECR), a report produced by Defence Equipment and Support (DE&S).

Safe Place, Ranges, LFTT areas are properly prescribed, clearly marked and conform to the design and safety criteria.

Safe Practice, PAM 21 prescribes the rules and regulations for the planning, conduct and supervision of firing.

Salisbury Plain Training Area (SPTA), a military training area in Dorset.

Section (Sect), consists of 6-10 soldiers.

Sergeant (Sgt), a non-commissioned officer placed above the rank of a corporal. The rank of sergeant corresponding roughly to a platoon second-in-command.

Service Inquiry (SI), a panel convened to investigate accidents on behalf of the DSA.

Special Investigation Branch (SIB), the name given to the detective branches of all three British military police arms: the Royal Navy Police, Royal Military Police and Royal Air Force Police. It is most closely associated with the Royal Military Police, which has the largest SIB. SIB investigators usually operate in plain clothes, although they may wear uniform when serving overseas. Members are usually senior non-commissioned officers (sergeants or petty officers or above) or commissioned officers, although the Royal Air Force SIB employs corporals who perform the same function as all SIB investigators.

Senior Investigating Officer (SIO), a position with the UK police.

Subject Matter Expert (SME), a person who is an authority in a particular area or topic.

Senior Planning Officer (SPO), an officer responsible for appointing, overseeing and mentoring an RCO.

Safety Supervisor (SS), is charged with the supervision of all firing as directed by the RCO

T

Tactical Advance to Battle (TAB), a march carrying kit and equipment.

Technical Advisory Section (TAS), a board of experts responsible for advice on range design and ricochet danger areas.

Tactical Engagement Simulation, (TES), laser systems fitted to weapons that allow simulated firing to take place.

Tactical Engagement Simulation Exercise (TESEX), a major exercise up to Battle Group level involving weapon systems and equipment that fire or register laser technology.

Target Operator (TO), an individual responsible for controlling the target exposure on a range.

Tactical Hearing Protection Basic User (THPS (BU)), ear plugs designed to protect hearing but allow situational awareness.

Terms of Reference (TOR), scope and limitations of an activity or area of knowledge.

Thermal Imaging (TI), a system that allows soldiers the ability to identify heat signatures in both day and night.

Topography, is the arrangement of the natural and artificial physical features of an area.

U

Under slung Grenade Launcher (UGL), a weapon used in conjunction with the SA80 that fires a specially-designed large-calibre projectile, often with an explosive, smoke or gas warhead.

V

VIPR, thermal Imaging sight, an in-service sight used in conjunction with the SA80 that enables soldiers to engage heat signatures accurately by day and night.

W

Webbing, Fighting Order, a set of tactical load bearing equipment issued to all members of the armed forces. This consists of a belt, shoulder harness (yoke) and a number of pouches used for storing ammunition water and emergency supplies.

Z

Zeroing (Zero), to accurately calibrate a weapon and a sight to a specific firer.



5 Sep 16

SI President
SI Members

Hd Defence AIB
DSA Legad

Copy to:

PS/SofS
MA/Min(AF)
PS/Min(DP)
PS/Min(DVRP)
PS/PUS
DPSO/CDS

MA/VCDS
NA/CNS
MA/CGS
PSO/CAS
MA/Comd JFC
MA/CFA

MA/Dir MAA
MA/GOC 1 (UK) Div
Dir DDC
CO 3 SCOTS

DSA DG/SI/05/16 – CONVENING ORDER FOR THE SERVICE INQUIRY INTO THE DEATH OF A SOLDIER DURING A NIGHT LIVE FIRING EXERCISE ON MONDAY 22 AUG 2016 AT 2257L, AT HEELY DOD BATTLE SHOOTING AREA, OTTERBURN TRAINING AREA.

1. A Service Inquiry (SI) is to be held under Section 343 of Armed Forces Act 2006 and in accordance with JSP 832 – Guide to Service Inquiries (Issue 1.0 Oct 08).
2. The purpose of this SI is to investigate the circumstances surrounding the subject incident and to make recommendations in order to prevent recurrence.
3. The SI Panel will formally convene at Abbey Wood (North), Juniper Building, Room J102 at 1500L on Tue 30 Aug 16.
4. The SI Panel comprises:

President: [REDACTED]

Members: 1: [REDACTED]
 2: [REDACTED]
5. The legal advisor to the SI is [REDACTED] and technical investigation/inquiry assistance is to be provided by the Defence Accident Investigation Branch (Defence AIB).
6. The SI is to investigate and report on the facts relating to the matters specified in its Terms of Reference (TOR) and otherwise to comply with those TOR (at Annex). It is to record all evidence and express opinions as directed in the TOR.

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

Head Defence AIB – Unrestricted Attendance.

Defence AIB investigators in their capacity as advisors to the SI Panel – Unrestricted Attendance².

██████████ - Occupational Psychologist (HF SME) – Unrestricted Attendance.

██████████ - Occupational Psychologist (HF SME) – Unrestricted Attendance.

8. The SI Panel will work initially from Otterburn Training Area iaw JSP832, Ch2 Annex F. Permanent working accommodation, equipment and assistance suitable for the nature and duration of the SI will be requested by the SI President in due course.
9. Reasonable costs will be borne by DG DSA under UIN D0456A.

Original Signed

R F Garwood
Air Mshl
DG DSA – Convening Authority

Annex:

- A. Terms of Reference for the Service Inquiry into the death of a soldier during a night live firing exercise on Monday 22 Aug 2016 at 2257L at Heely Dod Battle Shooting area, Otterburn Training Area.

² Dep Hd, SO1 Air and investigators as authorised by Hd Defence AIB.

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ANNEX A TO
SI Convening Order
Dated 30 Aug 16

TERMS OF REFERENCE FOR THE SERVICE INQUIRY INTO THE DEATH OF A SOLDIER DURING A NIGHT LIVE FIRING EXERCISE ON MONDAY 22 AUG 16 AT 2257L AT HEELY DOD BATTLE SHOOTING AREA, OTTERBURN TRAINING AREA.

1. As the nominated Inquiry Panel for the subject SI, you are to:
 - a. Investigate and, if possible, determine the cause of the occurrence, together with any contributory, aggravating and other factors and observations.
 - b. Ascertain whether the personnel (Service and civilian) were acting in the course of their duties.
 - c. Examine what policies, orders and instructions were applicable and whether they were appropriate and complied with.
 - d. Establish the level of training, relevant competencies, qualifications and currency of the individuals involved in the incident.
 - e. Identify if the levels of planning and preparation met the activities' objectives.
 - f. Review the levels of authority and supervision covering the task during which the incident occurred.
 - g. Investigate and comment on relevant fatigue implications of an individual's activities prior to the matter under investigation.
 - h. Determine the state of serviceability of relevant equipment.
 - i. Determine any equipment deficiencies.
 - j. Determine and comment on any broader organisational and/or resource factors.
 - k. Make appropriate recommendations to DG DSA.

2. During the course of your investigations, should you identify a potential conflict of interest between the Convening Authority and the Inquiry, you are to pause work and consult DG DSA. Following that advice it may be necessary to reconvene reporting directly to MOD PUS.

3. You are to ensure that any material provided to the Inquiry by any foreign state, is properly identified as such, and is marked and handled in accordance with MOD security guidance. This material continues to belong to those nations throughout the SI process. Before the SI report is released to a third party, authorization should be sought from the relevant authorities in those nations to release, whether in full or redacted form, any of their material included in the SI report, or amongst the documents supporting it. The relevant NATO European Policy (NEP) or International Policy and Plans (IPP) team should be informed early when dealing with any foreign state material.

PART 1.3 – NARRATIVE OF EVENTS

All times local (GMT).

Synopsis

1.3.1 The Black Watch 3rd Battalion The Royal Regiment of Scotland (3 SCOTS)¹ are currently based in Fort George Barracks, Inverness (See Figure 1). EXERCISE WESSEX STORM 16/4 (Ex WS 16/4) was a Field Training Unit (FTU) sponsored exercise, conducted in 4 phases, split between Otterburn Training Area (OTA) and Salisbury Plain Training Area (SPTA) 22 Aug - 21 Sep 16. The 1st phase of Ex WS 16/4 was internally conducted by the exercising unit, 3 SCOTS, at OTA 22-26 Aug 16. The aim was to bring the unit up to Live Fire Tactical Training (LFTT) at Platoon (PI)² strength, by day and night, in order to meet the training standard required to conduct a Company (Coy) level³ Combined Arms Live Firing Exercise (CALFEX) during the 2nd phase 29 Aug - 2 Sep 16. For the 3rd and 4th phases, 3 SCOTS deployed to SPTA to conduct instrumented Tactical Engagement Simulation Exercises (TESEX)⁴ as 3 SCOTS Battle Group (BG)⁵.

Exhibit 42



Figure 1 – Geographical Location of Otterburn Training Area

¹ An Infantry Battalion (Inf Bn) of approximately 500 soldiers.

² A PI consists of up to 28 men in 3 sections with a small headquarters (HQ).

³ A Coy consist of 3 PIs and a Headquarters (HQ) consisting of approximately 90 men.

⁴ TESEX is a test exercise where soldiers, weapon systems and vehicles are instrumented to simulate casualties and losses due to offensive action. Data is recorded and can be displayed in an After Action Review (AAR) to provide feedback on training.

⁵ An Inf Bn with attached arms (soldiers with other trades and skills from outside the Bn).

1.3.2 On Mon 22 Aug 16 during the 1st phase of the exercise whilst conducting a night Fire Team (FT)⁶ Black Light Attack⁷, without Infra-Red (IR) illumination, at Heely Dod Range (see Figure 7), Pte McPherson received a fatal gunshot wound at 2257. He was pronounced dead at the scene at 2345.

Exhibit 1

1.3.3 The exercise was carried out under the auspices of Infantry Training Volume IV Pamphlet Number 21 (Pam 21), Regulations for Training with Armoured Fighting Vehicles, Infantry Weapon Systems and Pyrotechnics Jan 16. Pam 21 is the primary direction under which all LFTT must be conducted.

Personalities

1.3.4 All soldiers involved directly in the Live Firing (LF) activity will be referred to as 'firers' and other members of 3 SCOTS and range staff will be referred to by their role title. All personnel employed at OTA will be identified as OTA staff or by their role.

1.3.5 **Private (Pte) McPherson.** Pte McPherson was assigned to 3 SCOTS in Feb 15 after completing the Combat Infantryman Course (CIC) at the Infantry Training Centre (Catterick) (ITC(C)). He was allocated to A Coy and after completing low level training exercises in the UK, he deployed to Kenya in May 15 as opposition force for another Infantry BG. He gained further training experience in Jun 15 in a Coy urban exercise in France. 3 SCOTS state that he had completed all of the mandatory progression for LFTT and most recently had conducted a Section (Sect) level⁸ LFTT black light attack with IR at Barry Buddon Ranges in Mar 16. In Jul 16 he operated with Night Vision Goggles (NVGs) whilst conducting Ex WS 3/16 phases 3/4 with another BG. He was a rifleman on the night of the accident equipped with a SA80 L85A2 Rifle (Figure 2), a LUCIE 2 Universal NVG⁹ (Figure 3) and a Laser Light Module (LLM) Mk 3¹⁰ (Figure 4). All equipment described will be covered in detail in the 1.4 analysis section of the report.

Exhibit 60



Figure 2 – SA80 L85 A2 Rifle



Figure 3 – LUCIE 2

⁶ A FT consists of 3-5 soldiers with a Lance Corporal (LCpl) commander.

⁷ Black Light refers to no additional illumination from rocket flares, white or Infra-Red (IR) light; this is a more complex operation as vision is less clear through night vision equipment.

⁸ A Sect consists of 6-10 soldiers, in 2 FTs, with a Corporal (Cpl) commander.

⁹ Universal night vision goggles used by drivers.

¹⁰ A device fitted to a rifle that when collimated allows the operator to mark targets in the IR and visible spectrum to allow for shoulder controlled aimed shots.

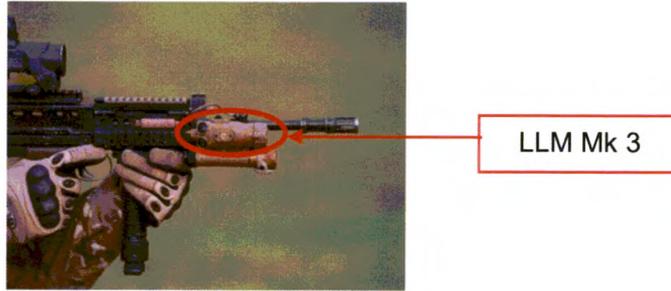


Figure 4 – LLM Mk 3

1.3.6 **Senior Planning Officer (SPO).** The SPO was a Major (Maj) who had 16 years military experience, which included a tour at the Infantry Battle School (IBS). He was also the 'A' Coy Commander (Coy Comd) and had been in post for 16 months prior to the accident. During his time as Coy Comd he had been involved in several exercises within the UK, overseas and the Bn Light Mechanised (Lt Mech) Conversion¹¹. With regards to the accident as the SPO, he was responsible for the overarching planning of the range and ensuring that his Range Conducting Officer (RCO) was suitably qualified, conducting the training in a safe manner and in line with the relevant training safety manuals. The SPO was present at the time of the accident.

Exhibit 32

1.3.7 **Company Second in Command (Coy 2IC).** The 'A' Coy 2IC who was a Lieutenant (Lt), had held the SA(A)(90) qualification¹² since Dec 13 and arrived at 3 SCOTS in Jan 14. He joined A Coy as Coy 2IC in Jan 16. In this role, he was responsible for the maintenance of training records for the Coy. During his career to date he has deployed on Op VOCATE¹³ and Op TOSCA¹⁴. The Coy 2IC was observing the FT attack range at the time of the accident.

1.3.8 **Company Sergeant Major (CSM).** The CSM had 17 years' experience in the Army and was appointed as 'A' Coy CSM on promotion to WO2 in Apr 16. During his career, he has deployed on Op BANNER¹⁵, Op TELIC¹⁶, Op HERRICK¹⁷ and Op VOCATE. The CSM was on the range at the Heely Dod troop shelter which was the holding area, at the time of the accident.

1.3.9 **Planning Officer (PO).** The PO was a Lt who had been in the military for 30 months prior to the accident. He had held the SA(A)(90) qualification since Aug 15 and was a PI Comd. He had been the RCO for all daytime serials on the 22 Aug 16 and was the PO for both the day and night ranges (further detail on the range serials will be covered in the 1.3 Sequence of Events 1.3.45-1.3.53). The

¹¹ Lt Mech Conversion is the conversion from a basic infantry unit to an infantry unit equipped with protected mobility fleet vehicles for transport and operations.

¹² Plan, conduct and supervise all live or blank firing with Infantry Weapon Systems and pyrotechnics.

¹³ UK commitment to stabilise Libya by training up to 2000 Libyan personnel in the UK.

¹⁴ British contribution to the United Nations Peacekeeping Force in Cyprus (UNFICYP).

¹⁵ Op BANNER was the operational name under which all of the United Kingdom's military operations in Northern Ireland were referred to Aug 69 – Jul 07.

¹⁶ Op TELIC was the operational name under which all of the United Kingdom's military operations in Iraq were conducted between the start of the Invasion on 19 Mar 03 and the withdrawal of the last remaining British Forces on 22 May 11.

¹⁷ Op HERRICK is the operational name under which all British operations in the War in Afghanistan post 2001 until the end of 2014.



PO is responsible for the design of the training and is to be competent and qualified. He had been an RCO on two previous LFTT exercises; however, this was his first experience as a PO.

Exhibit 152

1.3.10 **Spare Platoon Commander (Spare PI Comd).** He was PI Comd of 2 PI prior to it being temporarily disbanded. He arrived at 3 SCOTS in Dec 14 after completing his SA(A)(90) qualification in Nov 14. During his time with 3 SCOTS, he deployed on two major overseas exercises. The Spare PI Comd was temporarily assigned as the Coy 2IC between Nov 15 and Jan 16, which included an LFTT package and maintaining records in Nov 15. As Coy 2IC during that period, he would have been responsible for maintaining Coy records. The Spare PI Comd was present on the range at the time of the accident.

1.3.11 **Range Conducting Officer (RCO).** The RCO had recently assumed the role as PI Comd of 3 PI. He was a 2nd Lieutenant (2Lt) who had completed his Platoon Commanders Battle Course (PCBC) which included the SA(A)(90) course in May 16. Prior to commissioning, he had 5 years' experience as a Junior Non Commissioned Officer (JNCO) within another Corps. This was the first range that he had run since completing his qualifying course. He was responsible for conducting the range in a safe manner, in line with the relevant safety publications.

1.3.12 **Ammunition Senior Non Commissioned Officer (Ammo SNCO).** The Ammo SNCO had been the PI Sergeant (Sgt) of 3 PI for 14 months prior to the accident. He had served for 10 years and had held the SA(A)(90) qualification for 2 years. As Ammo SNCO, he was responsible for the accountability and issue of the correct ammunition natures as directed by the RCO. At the time of the accident, he was positioned at the troop shelter, in the holding area.

1.3.13 **Target Operator (TO).** The TO was a JNCO who had been in the military for 15 years and has completed the SA(A)(90) qualification. This qualification was not active due to him not holding the required minimum rank of Sgt. As the TO, he was responsible for managing the targets and associated system under the control of the RCO. The TO was alongside the RCO during the accident.

Exhibit 29

1.3.14 **Safety Supervisor 1 (SS1).** SS1 was a Corporal (Cpl) who had been in the military for 7 ½ years. He was appointed as a Sect Comd in Aug 15. As SS1 he was responsible for ensuring the safety of Pte McPherson, Firer 2 and Firer 3 during the accident. SS1 held the SA(E)(90) qualification, which enabled him to act as a Safety Supervisor during LFTT exercises using shoulder controlled weapons and pistols; this included the supervision of night firing with and without illumination.

Exhibit 29

1.3.15 **Safety Supervisor 2 (SS2).** SS2 was a Cpl who had been in the military for 10 years. He arrived in post in Nov 13. As SS2 he was responsible for ensuring the safety of Firer 4 and Firer 5 during the accident. SS2 held the SA(E)(90) qualification.

Exhibit 29

1.3.16 **Firer 2.** Firer 2 was a Pte who had been in the military for 5 ½ years. He was a rifleman on the range at the time of the accident and was equipped with a SA80 L85A2 Rifle, Head Mounted Night Vision System (HMNVS) Ver 2 (Figure 5) and a LLM Mk 3.





Figure 5 – HMNVS

1.3.17 **Firer 3.** Firer 3 was a Pte who had been in the military for 2 ½ years. He was a rifleman on the range at the time of the accident equipped with SA80 L85A2 Rifle and a VIPR Thermal Imaging (TI) Sight¹⁸ (Figure 6).



Figure 6 – VIPR TI Sight

1.3.18 **Firer 4.** Firer 4 was a Lance Corporal (LCpl) who had been in the military for 2 ½ years. During the accident he was the FT Comd and was equipped with an SA80 L85A2 Rifle with an Under Slung Grenade Launcher (UGL) attached, HMNVS Ver 2 and LLM Mk 3.

1.3.19 **Firer 5.** Firer 5 was a Pte who had been in the military for 5 years. He was a rifleman on the range at the time of the accident equipped with SA80 L85A2 Rifle, HMNVS Ver 2 and LLM Mk 3.

1.3.20 **Previous Detail Firer 1.** Previous Detail Firer 1 was a Pte who had been in the military for 7 months prior to the accident. He was a rifleman on the night of the accident equipped with a SA80 L85A2 Rifle, HMNVS Ver 2 and LLM Mk 3.

1.3.21 **Previous Detail Firer 2.** Previous Detail Firer 2 was a Pte who had been in the military for 1 ½ years. He was a rifleman on the night of the accident equipped with SA80 L85A2 Rifle and a VIPR TI Sight.

1.3.22 **Previous Detail Firer 3.** Previous Detail Firer 3 was a Pte who had been in the military for 10 months prior to the accident. He was a rifleman on the night of the accident equipped with a SA80 L85A2 Rifle, HMNVS Ver 2 and LLM Mk 3.

1.3.23 **Previous Detail Firer 4.** Previous Detail Firer 4 was a Pte who had been in the military for 2 ½ years. For his run through, he was the FT Comd and

¹⁸ An in service sight used in conjunction with the SA80 that enables soldiers to engage heat signatures accurately.

was equipped with SA80 L85A2 Rifle and a VIPR TI Sight.

1.3.24 **Previous Detail Firer 5.** Previous Detail Firer 5 was a Pte who had been in the military for 3 years. He was a rifleman on the night of the accident equipped with a SA80 L85A2 Rifle, a LUCIE 2 Universal NVG and an LLM Mk 3.

1.3.25 **Commanding Officer (CO).** The CO 3 SCOTS had 18 years' service and had completed numerous operational deployments. He took command of the Bn in Sep 14 and was due to hand over in Sep 16. The CO was the Exercise Director (Ex Dir) for the exercise and all ranges taking place. He was responsible for ensuring that the SPOs and RCOs carried out their roles in the correct manner in line with the relevant safety publications, specifically Pam 21.

1.3.26 **Battalion Second in Command (Bn 2IC).** The Bn 2IC was commissioned in 2001. He had been a Coy Comd in the Bn prior to assuming a staff role before taking up his current post as Bn 2IC in Apr 16. On the night of the accident he was in 3 SCOTS HQ Operations Room (Ops Rm) in OTA Camp Figure 7.

1.3.27 **Regimental Medical Officer (RMO).** The RMO was a Maj who had served 7 years since qualifying as a doctor. He was employed as a RMO until 2012 when he subsequently undertook training to become a General Practitioner (GP). The appointment of RMO had been vacant, since Mar 16. He assumed the post of RMO 3 SCOTS 1 week prior to the Bn deploying for Ex WS 16/4 in Aug 16.

1.3.28 **Combat Medical Technician (CMT).** The CMT was a Royal Army Medical Corps (RAMC) LCpl with 3 ½ years' experience. He was employed as the Coy Medic on 22 Aug 16 and was centrally located on the training area at the Electronic Target Range (ETR)¹⁹ to support the LFTT with a Battle Field Ambulance (BFA) (Figure 7).

1.3.29 **Medical Sergeant (Med Sgt).** The Med Sgt was a qualified CMT from the RAMC with 15 years combined service. Prior to transferring to the Royal Army Medical Corps (RAMC) he was a soldier within 3 SCOTS who deployed on several operational deployments. He arrived as the Med Sgt in Jan 16 and was responsible for all medical aspects within the Bn whilst the role of RMO was gapped from Mar 16.

1.3.30 **Training Officer (Trg Offr).** The Trg Offr was a Capt with 24 years' experience. He was a Late Entry (LE)²⁰ Officer who had been a Regimental Sergeant Major (RSM) prior to commissioning. This was his second commissioned appointment within the Bn and he assumed the role in Jun 16. He had been involved in the planning of the ranges and was at 3 SCOTS HQ Ops Room at the time of the accident.

1.3.31 **Training Sergeant (Trg Sgt).** The Trg Sgt had initially served in the Army for 5 years prior to a career break and since re-joining he had completed 14 years combined service. He was promoted to Sgt and assumed the role of 2 PI Sgt

Exhibit 112

¹⁹ A static firing range that utilises targets that operate electronically via wire connection in the ground.

²⁰ A LE Officer is an officer who has commissioned after soldier service usually all the way up to Warrant Officer (WO).



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in 2014 before moving to the Bn Trg Wing in Nov 16. During his service, he had completed multiple operational deployments. The Trg Sgt initially conducted the planning for the Heely Dod Range prior to handing over to the PO and RCO on 21 Aug 16. The Trg Sgt was not present at Heely Dod Range when the accident occurred.

1.3.32 **Operations Room (Ops Rm) Signaller (Sig).** The Sig on duty in 3 SCOTS HQ at the time of the accident was a Pte who had served for 5 ½ years. He was a very experienced Sig and was familiar with all Communication Information Systems (CIS) equipment and protocols in use. He was responsible for maintaining the telephone/radio log of events.

1.3.33 **Training Safety Officer (TSO).** The TSO was a Capt with 28 years' experience. He was a LE Offr who assumed the role as OTA TSO in Mar 15. He was responsible for all range and exercising area safety within OTA as well as the production and updating of Range Standing Orders and Training Area Standing Orders.

1.3.34 **Range Control Operative.** The Range Control Operative was a civilian who was employed by Landmarc for Defence Infrastructure Organisation (DIO) Trg OTA. She was experienced in her role and received update training on a regular basis. At the time of the accident she was on duty in OTA Range Control (Figure 7). She coordinated the civilian ambulance medical response and maintained a telephone/radio log.

Recent History

1.3.35 **Op VOCATE.** 3 SCOTS deployed to Basingbourne Camp, in Feb 14 for Op VOCATE taking the majority of their Chain of Command (CoC)²¹ and NCO Cadre with them due to the significant number of instructors required to complete the training requirement for the deployment. A skeleton CoC along with the majority of the Pte soldiers were left at Fort George for the duration. Prior to this deployment, 3 SCOTS had not conducted a battalion led collective training package since Autumn 12 due to operational commitments. Op VOCATE concluded early in Nov 14, as directed by UK government and Ministry of Defence (MOD). Although on UK soil, the deployment was treated as an Operational Tour due to the nature of the activity training the Libyans in an enclosed environment and confined to camp.

1.3.36 **Op TOSCA.** Upon return from Op VOCATE in Nov 14, the Bn took leave prior to moving straight into a 6 week Pre Deployment Training (PDT) package in Jan 15 for Op TOSCA. There was limited time for the CO to plan for Op TOSCA due to the Bn's complex involvement in Op VOCATE. The Bn deployed with the CO in Mar 15; however, the Bn 2IC was left behind in charge of the Rear Operations Group (ROG), with 'A' Coy in its entirety. The Op TOSCA deployment demanded little in the form of conventional soldiering skills. Those remaining on the ROG deployed to Kenya as Opposing Forces (OPFOR)²² for another BG (2 LANCS) on Ex ASKARI STORM in May 15, which incorporated LFTT and other

Exhibit 143

Witness 20

Witness 20

Witness 20

Witness 25

Witness 20

Witness 21

Witness 20

Witness 21

Witness 20

²¹ The chain of command is the line of authority and responsibility along which orders are passed within a military unit.

²² Acting as enemy to create a realistic ex for the supported BG.

conventional soldiering skills. This was followed by Ex GAULISH EAGLE, a Coy urban Ops exercise in France in Jun 15, which was a blank²³ exercise utilising conventional soldiering skills. During the periods of Op VOCATE and Op TOSCA, it was deemed, by the CO, that the conventional soldiering skills of the Bn as a whole had waned, this was due to the Bn being focussed on externally run training for a specific campaign rather than training themselves for contingency.

Witness 21

Witness 20

1.3.37 Light Mechanised Conversion. Prior to the Bn's return from Op TOSCA, 'A' Coy were to work on Lt Mech Skills and become the lead element for the Bn's conversion efforts. 3 SCOTS were due to commence Lt Mech conversion in Apr 16; however, timelines were advanced and it commenced in Nov 15 on the Bn's return from Op TOSCA. Driver and crew conversion courses on FOXHOUND²⁴, RWMIK²⁵ and HUSKY²⁶ platforms ran all the way through to Jun 16. The Bn were expected to convert to Lt Mech in a very short time period and this was reduced further to 10 months, due to vehicle availability. Due to the small vehicle fleet available and the limited time to convert, the Bn had to adopt a centralised approach to training, in turn restricting the training opportunities at Coy level in order to reach Collective Training level 3 (CT3)²⁷ by Oct 16.

Exhibit 143

Witness 20

Witness 25

Exhibit 62

Witness 20

Witness 20

1.3.38 LFTT build up Autumn 15. A Coy conducted Ex DEESIDE GRENADIER its own in-house live fire training to CT1²⁸. The exercise was run at Kirkcudbright Training Area between 26 Nov – 4 Dec 15. The aim was to achieve the level of section attack²⁹ by day and FT attack³⁰ by night but greater progression was achieved, reaching platoon by day and section by night because of lower numbers available to train. The A Coy CoC was involved in the planning and conducting of the ranges throughout the exercise.

Exhibit 152

Witness 1

Exhibit 152

1.3.39 LFTT build up Spring 16. A Coy conducted further LF serials at Barry Buddon in Mar 16. The exercise achieved section by day and night. It was a re-run of the LFTT ranges at Kirkcudbright Training Area in order to capture those who missed the previous ranges in Nov/Dec 15. The Panel has been verbally advised by 3 SCOTS that all those who fired on the night of the accident were current and fired in either Nov 15 or Mar 16. OC A Coy wanted to achieve black light with IR illumination³¹ at night to be incorporated into the LF serials, so that the Coy could become proficient in fighting at night, in preparation for returning to contingency³².

Exhibit 60

Witness 1

Witness 1

1.3.40 Ex WS 16/3. 3 SCOTS were informed in Mar 16 that they would need to commit a Coy to support the SCOTS Dragoon Guards (SCOTS DG) BG TESEX

²³ An exercise where blank, which is a type of cartridge for a firearm that contains gunpowder but no bullet or shot, is used instead of live rounds.

²⁴ FOXHOUND is a Light Protected Patrol Vehicle.

²⁵ RWMIK (Revised Weapons Mounted Installation Kit) is a lightly armoured, highly mobile fire support and force protection Land Rover.

²⁶ HUSKY is a protected support vehicle, providing a highly mobile and flexible load carrying vehicle.

²⁷ CT3 is a multiple sub-unit (Coy level) training exercise in a task organised unit or combined arms BG context.

²⁸ Collective Training Level 1 - Coy validated training up to PI level.

²⁹ Sect level offensive actions to deal with an enemy.

³⁰ FT level offensive actions to deal with an enemy.

³¹ The use of IR illumination at night in conjunction with Night Vision Devices.

³² Preparing for a future event which is possible but cannot be predicted with certainty.

on SPTA for the 3rd and 4th phases of Ex WS 16/3. A Coy was selected to take the lead on the exercise comprising their HQ and 2 rifle platoons. They were reinforced with a rifle platoon from B Coy and the Machine Gun Platoon from D Coy. Additionally, A Coy OC deployed with his Coy HQ to conduct a 2 week Command and Staff Training (CAST) with the SCOTS DG BG HQ. CO 3 SCOTS requested, via his CoC, whether another unit could cover Ex WS 16/3, but there was no replacement available. A Coy was used as a STRIKE³³ company by the SCOTS DG and they were able to utilise night optics for a number of dry³⁴ serials. Following the exercise, 3 SCOTS were stood down for 3 weeks summer leave.

Exhibit 60
Witness 21

Witness 20
Witness 20

Pre-Accident Events

1.3.41 The planning for Ex WS 16/4 commenced in Mar 16 with a coordination (coord) meeting taking place between Field Training Unit (FTU), 3 SCOTS CoC and 51 Infantry Brigade (51 Inf Bde)³⁵. A range recce³⁶ party travelled to OTA on 10 May 16 to conduct initial recces and receive mandatory range briefs. The PO conducted the initial recce but determined that, due to his existing work load, he could not effectively plan all the necessary ranges for A Coy. As a consequence the Trg Sgt was assigned to conduct the planning of the ranges as A Coy deployed on Ex WS 16/3. He conducted a recce in Jul 16 for all A Coy ranges and submitted the relevant Range Action and Safety Plans (RASP)³⁷ for the ranges being used. These RASPs, along with most others from the other Coys, were returned to unit for failing the Gross Error Checks³⁸ and having formatting issues. Upon their return from summer leave, A Coy's contingent of range staff for Ex WS 16/4 edited the previously submitted and returned RASPs, ensuring that the Gross Error Checks, identified by OTA, were met prior to resubmission.

Exhibit 86
Witness 4
Exhibit52

Witness 4

Witness 29

Witness 29

1.3.42 The Trg Offr deployed from Fort George, along with the RCOs and the range build teams, as part of the advance party on 17 Aug 16. The SPO, PO and RCO from A Coy, who ran the range during the accident on 22 Aug 16, did not deploy with the other RCOs. A fleet move of 50 vehicles departed Fort George on 18 Aug as part of a 2 day road move. The main body of the Bn, which included Pte McPherson, deployed by coach on Sat 20 Aug and arrived at Otterburn Camp at approximately 1500. The main body contained the SPO, PO and RCO from A Coy who ran the range during the accident on 22 Aug 16.

Witness 25

Witness 25
Witness 21
Exhibit 220
Witness 4
Witness 6

1.3.43 Upon arrival at Otterburn Camp the Bn was allocated accommodation. The Trg Offr delivered a communications, administration and generic OTA brief to all personnel. The SPO, PO and RCO conducted planning and range recces at Heely Dod Range on the morning of Sun 21 Aug 16 before the SPO moved onto recce other ranges. Upon the SPO's return to Heely Dod Range, the CO and the

Witness 4

Witness 1

³³ STRIKE – To manoeuvre and then take direct action to achieve the mission.

³⁴ Continuing the training serial without firing the weapon system.

³⁵ A brigade is a collection of regiments, battalions and sub units commanded by a headquarters.

³⁶ A vital part of the planning process where the RCO is to visit the range to plan the LF activity, ensure all safety aspects are considered, ensure local Standing Orders are followed and consult with Range Control reference facility and target availability.

³⁷ A mandatory document produced for all LFTT.

³⁸ Gross Error Checks are conducted to ensure that any safety discrepancies are highlighted and amended prior to the commencement of LF. Examples of a Gross Error Check for a LFTT range would include bearings, grid references, comprehensive and accurate medical plan etc.

FTU Small Arms School Corps (SASC) Sergeant Major Instructor (SMI)³⁹ were present and received a brief from the PO and RCO. They left content with the plans for the range. The SPO, PO and RCO returned to Otterburn Camp for lunch before returning with the safety team to walk through/talk through the planned day time ranges to be conducted Mon 22 Aug. The night time safety team (SS1 and SS2) were not present for these walk throughs as they were delivering training at Otterburn Camp.

Witness 1
Witness 6

Witness 4
Witness 9

1.3.44 Throughout Sun 21 Aug the majority of the Bn conducted pre-exercise administration including kit issue and in-camp training which included section level tactics. Two CMTs from 102 Logistics Brigade (102 Log Bde) did not arrive as expected to support 3 SCOTS on Sun 21 Aug, which prevented the 3 SCOTS CMT conducting remedial training. To use time productively, the Trg Offr took the 3 SCOTS CMTs on a familiarisation visit to all ranges that would be active during the Live Firing package.

Witness 9

Witness 25

Witness 25

Sequence of Events – 22 Aug 16

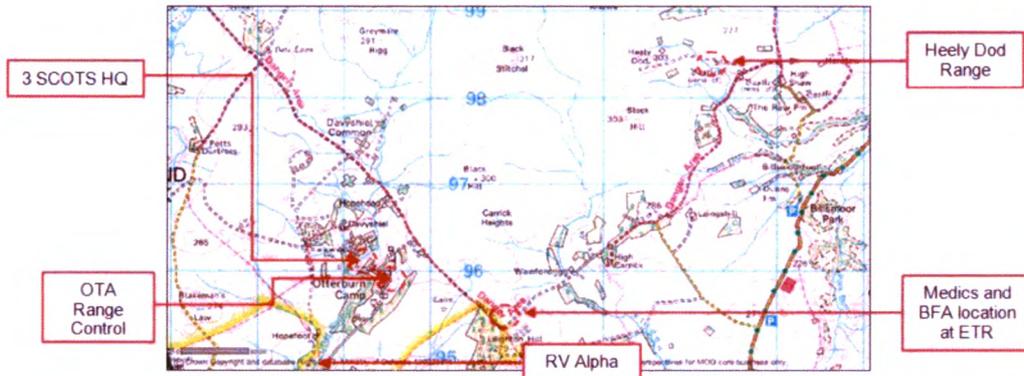


Figure 7 – Range Control, 3 SCOTS HQ, BFA and Range Locations

1.3.45 **0600-1026.** A Coy had reveille at 0600 on 22 Aug and collected their weapons prior to breakfast. For the move to the range the Coy was split into 2. 3 PI moved in FOXHOUND vehicles departing Otterburn Camp at 0800 and arrived at a Leaguer point⁴⁰ at approximately 0845. They concealed the vehicles using camouflage nets prior to transiting on foot, for approx 1 mile, to the range. 1 PI moved on foot from Otterburn Camp to Heely Dod Range, accompanied by the Coy Comd. They arrived at Heely Dod at approximately 1000. The PO who ran the daytime ranges had wanted to commence firing when the range opened at 0900. However, the 2 separate transiting PIs were both delayed; 1 PI miscalculated the time it took to march to the range and 3 PI were delayed because they got lost during transit. Upon arrival, the SPO checked with the PO and RCO to ensure they were happy before the PO delivered a safety brief to exercising troops, which included checking that hearing protection, body armour and helmets were serviceable. The PO rang through to Range Control at 1026 to gain permission to fire, which was granted. SS1 moved separately from the remainder of the Coy as

Witness 11

Witness 10

Witness 1
Witness 6

Witness 1
Witness 1
Witness 4
Exhibit 53
Witness 9

³⁹ A SASC SMI is an instructor in Infantry weapons and provides safety advice on LF.

⁴⁰ A temporary military camp formed by vehicles.

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he had to conduct an Individual Battle Shooting Range prior to moving to Heely Dod Range (Figure 7).

1.3.46 **1026-1700.** After range clearance was granted by Range Control, the PO conducted static shoots which included zero⁴¹, bayonet⁴² and automatic⁴³ for the whole of the Coy. The Coy 2IC used hard copy records⁴⁴ to inform the PO which soldiers needed to complete which shoots, in order to ensure that correct progression of training was met in accordance with the Operational Shooting Policy (OSP). A Sect of Royal Engineers (RE) unexpectedly arrived at the range and were required to conduct all shoots to ensure they also met the correct transition, further compressing range timings. The Coy stopped for lunch at approximately 1300 after the static shoots had been completed. A Coy commenced Close Quarter Battle (CQB)⁴⁵ followed by Individual Fire and Manoeuvre (F&M)⁴⁶, for those who required it, between 1330-1430. For all of the daytime shoots conducted on 22 Aug, prior to the day FT attack, there were no RASPs produced. For the CQB and individual F&M shoots, the same area of ground and targetry were used that would be utilised for the FT by day. This was to ensure the soldiers knew the range well before introducing the complexities of night firing. It was decided between the SPO, PO and RCO that 3 PI would conduct FT attack at night on 22 Aug 16 and 1 PI on 23 Aug 16. The PO, who at this time was acting as RCO for the day ranges, completed FT by day for 3 PI and approximately half of 1 PI prior to a mandatory check fire period⁴⁷ between 1700-2000. Due to the late commencement of the range, unexpected firers (RE section) and the amount of different shoots conducted for the Coy, the FT by day shoots were not completed prior to the check fire, so had to be conducted post 2000, when it was still light.

1.3.47 **1700-2000.** During the mandatory check fire period, the firers received lessons on Next Generation Light Anti-tank Weapon (NLAW) and Range Cards. The Coy Comd assisted in the provision of an evening meal to the firers prior to departing the range for a Bn command and co-ord meeting. The night time RCO conducted a safety brief with his safety supervisors between 1815-1845. The walk through⁴⁸ was conducted at the top of the range near the range hut and was conducted from a static position rather than walking the range. After the briefs, the Safety Supervisors sought further guidance on the left and right limits for the range⁴⁹. The night time RCO then prepared the night ranges between 1845-1930 before moving all firers to the holding area (Figure 8).

Witness 4
Witness 1
Witness 4
Witness 4
Witness 6
Witness 4
Witness 6
Witness 10
Witness 13
Witness 10
Witness 1
Witness 4
Witness 6
Witness 6
Witness 9
Witness 6

⁴¹ Accurately calibrate a weapon and a sight to a specific firer.

⁴² Bayonet Shoot - To practise that the firer can fire his weapon correctly with a bayonet fitted.

⁴³ Automatic Shoot - To practise that the firer can hold, aim and fire his weapon correctly when firing bursts.

⁴⁴ Physical records on paper rather than an electronic format.

⁴⁵ A CQB range is where a soldier moves on their own down a range assaulting targets as they appear.

⁴⁶ During Individual F&M one soldier remains static providing covering fire whilst the other moves.

⁴⁷ A period of no firing usually in line with local Range Standing Orders or if deemed necessary due to possible safety issues.

⁴⁸ During a walk through the RCO walks the ground with his SS and TO in order to rehearse target sequence, discuss firing arcs and limits of troop movement on the range.

⁴⁹ How far left and right the firers could move and still be firing in a safe direction on the range.



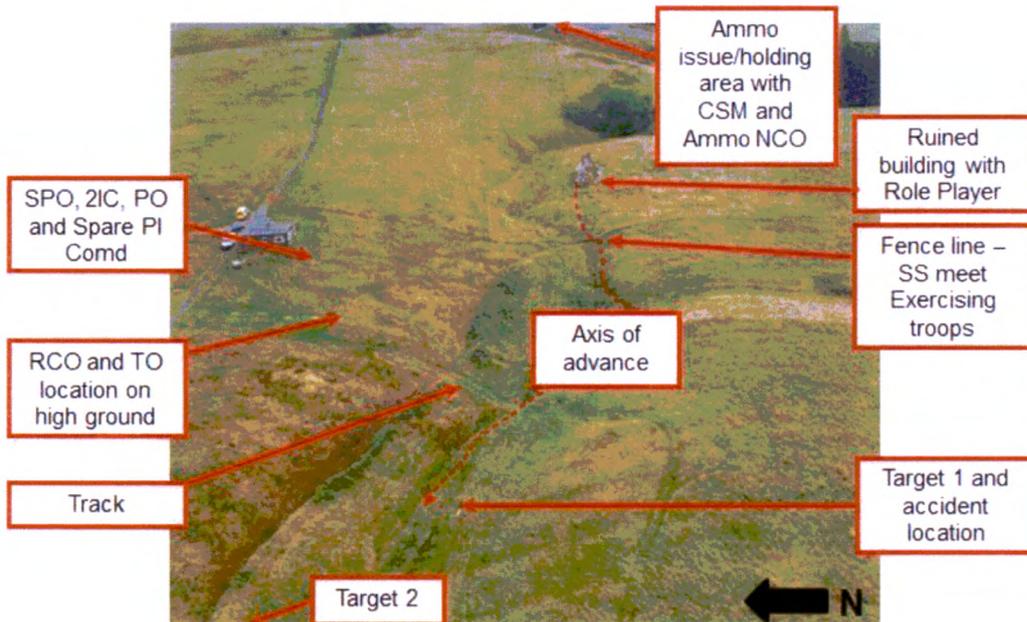


Figure 8 – Location of Coy Personalities

1.3.48 **2000-2200.** The remaining run-throughs of FT attack by day were completed after the range became active at 2000. Whilst the FT by day run-throughs were taking place, 3 PI and the RE sect received a night time safety brief at the troop shelter holding pen. After completion of the daytime ranges, the SPO told the PO and night time RCO to conduct a thorough handover/ takeover but did not witness it as he had to return to the Bn co-ord meeting. The RASP for FT by night was produced and signed by the PO; however, the night time RCO did not sign the RASP when he took over the range. The night time RCO did not sign the RASP, did not sign onto the range using the 906A range log⁵⁰ and the PO did not sign off the range through the 906A. This action was completed on the morning of 24 Aug 16 by the PO and RCO. The RCO then conducted a Limit of Night Visibility (LNV) shoot⁵¹; however, it was not conducted in line with the OSP as no Cyalumes were used. He also conducted a VIPR sight zero, ommon Weapon Sight (CWS) sight zero and LLM check zero shoots. Upon completion of these shoots, 1 PI and the RE Sect departed Heely Dod Range for OTA Camp, as they were to conduct FT attack by night on 23 Aug. There were no RASPs produced for all of the night time shoots conducted on 22 Aug prior to FT attack.

Witness 6

Witness 6

Witness 1

Exhibit 17

Witness 6

Exhibit 56

Witness 6

Witness 6

Witness 1

1.3.49 **2200.** Prior to commencement of the FT night attack on Heely Dod Range, the SPO spoke to the RCO and Ammo SNCO to confirm rehearsals had taken place. The SPO decided that he would follow the first FT from behind to view their use of tactics and equipment. The first FT was issued 2 x magazines of 15 rounds, rather than 2 of 30. This was because the RCO had been informed that there was a shortage of ammunition. There was no hand fired illumination held on the range. At approximately 2200, the first FT were then released from the holding pen by the Ammo SNCO. This was communicated through to the RCO and the

Witness 1

Witness 1

Witness 6

Exhibit 207

Witness 6

⁵⁰ A mandated document that needs to be completed before and after firing on a particular range by the RCO.

⁵¹ LNV Shoot - To practise and assess the methods of engaging targets at the limit of night visibility.

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remainder of the safety team via Personal Role Radio (PRR)⁵² comms. Each firer had an IR Cyalume⁵³ attached to the back of their helmets and there were also IR Cyalumes on the ground to aid them in locating the route to the role player⁵⁴ (Figure 8). Once with the role player, the FT Comd was given the battle picture⁵⁵, after which weapons were loaded⁵⁶ and the FT set off on the axis of advance (Figure 9). When the FT crossed the fence, SS1 and SS2 followed them and made the FT ready⁵⁷. The RCO and TO positioned themselves on the high ground in order to ensure they had situational awareness (Figure 8).

Witness 6
Witness 19
Witness 6
Witness 6

1.3.50 **2200-2230.** Due to the limited light levels and lack of experience of firing at night, the firers kept falling over and struggled to identify the targets. Some firers were surprised as they had expected illumination to aid in the identification of the targets. Whilst going through the range, the firers engaged targets when they could identify them. Firer 2 of the first FT, who was issued with a VIPR T1 sight, found it difficult to identify targets as there were no thermal targets in use on the range. When members of the FT had expended ammunition, they continued "dry". Once all ammunition had been expended within the FT, the RCO called "STOP" and told SS1 and SS2 to use white light (torch) and clear the firers off the range prior to sending them up a track towards the troop shelter. On their way to the troop shelter, they received a hot debrief⁵⁸ and the SPO congratulated them on a good performance, specifically on their use of the LLM to identify targets. Once debriefed, they were sent back to the troop shelter where the Ammo SNCO accounted for the firers. En route, the FT discussed the practice; 2 firers commented that they found the shoot challenging because they had difficulty moving over the ground and identifying targets in the black light.

Witness 19
Witness 17
Witness 10
Witness 6
Witness 1
Witness 6
Witness 19
Witness 17

1.3.51 **2230.** The second FT consisted of 5 personnel, which included one LCpl as the FT Comd (Firer 4) and 4 Pte soldiers, one of whom was Pte McPherson. All firers were using a 5.56mm L85A2 Rifle. Due to firing being conducted at night, all of the FT and SS were using some form of night vision device. Three of the FT were using HMNVS in conjunction with a LLM Mk3 fitted to their weapon. Pte McPherson was using a LUCIE NVG in conjunction with a LLM Mk3. The remaining FT member (Firer 3) had a VIPR T1 sight fitted to his weapon and was not wearing any other night vision device. The RCO, SS1, SS2 and the TO were wearing HMNVS. All of the FT and the SS were wearing issued helmets and body armour.

Exhibit 1

⁵² PRR is a small Ultra High Frequency (UHF) transmitter-receiver radio issued to the British Armed Forces. It has a range of up to 500m.

⁵³ A self-contained, short-term light-source. It consists of a translucent plastic tube containing isolated substances that, when combined, make light through a chemical reaction, so it does not require an external energy source.

⁵⁴ Person specifically assigned to brief the firers the scenario and provide a battle picture.

⁵⁵ A short set of orders describing the ground, enemy and mission to the FT in order to launch a realistic attack.

⁵⁶ A loaded weapon is a weapon with a magazine fitted but no rounds in the chamber.

⁵⁷ Ready to fire is when the weapon is cocked and a round is in the chamber.

⁵⁸ A hot debrief is a lessons learned review carried out directly after the exercise.

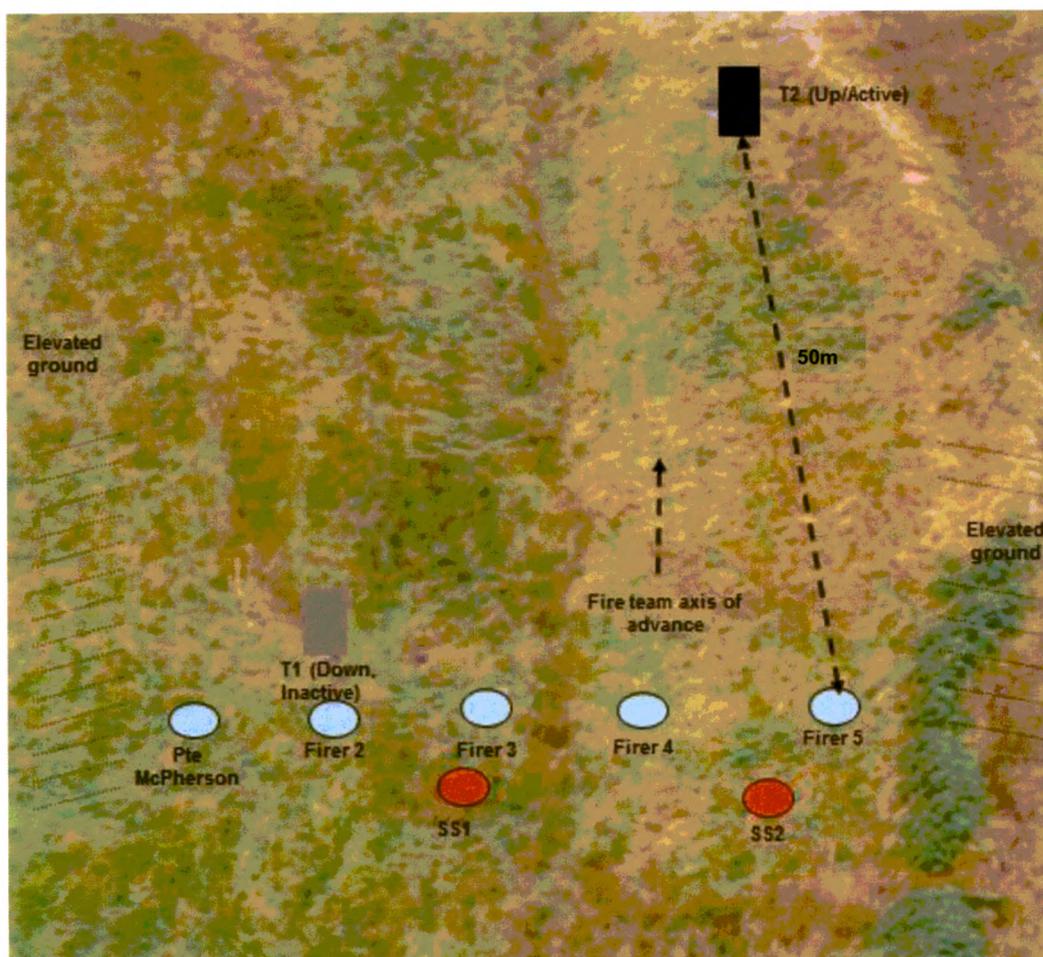


Figure 9 – Section Composition and Order of March

1.3.52 **2230-2245.** The FT members each had a single IR Cyalume attached to the rear of their helmets. In order to differentiate between the FT and SS1 and SS2, the safety staff had two IR Cyalumes. As the firers moved through the range towards the Role Player, Firer 2 was surprised there was no illumination being used on the range. The FT were instructed to load their weapons by the Role Player and he issued Firer 4 with the battle picture (Figure 8). Firer 4 briefed his FT on the battle picture prior to moving off.

Witness 11

1.3.53 **2245-2257.** After leaving the ruined building, the FT moved in single file⁵⁹ to a fence line, which they crossed, meeting the SS and making their weapons ready. After the fence they formed into extended line and advanced toward the enemy threat as previously explained. Approximately 3-5 m before the track, the 1st target was exposed and a target indication was given by Firer 4. The targets were on “2 round bob”, which meant that targets would fall after 2 hits and then would come back up again until the TO used the target control panel to send a different command via wireless signal. The FT began to close with and engage the target using Fire and Movement (F&M). Firer 3 did not fire throughout the exercise

Witness 1

Witness 10

⁵⁹ File is a sect formation; in this case for a number of troops drawn up in line ahead, i.e. one behind the other.

OFFICIAL SENSITIVE

as he was unable to identify targets. Firer 4 and Firer 5 moved first (right hand pair) and then the remaining 3 (Pte McPherson, Firer 2 and Firer 3), moved level with them. Once the first target was destroyed (dropped down out of sight), the FT moved forward until the 2nd target was identified by Firers 4 and 5. A fire control order was issued by Firer 4 and Firer 4 and 5 engaged the target. SS1 identified that Firer 2 was falling behind but did not order him to check fire. Instead, SS1 directed Firer 2 to move forward. SS1 then saw Pte McPherson (who was on the far left of the FT) fall and not get up. SS1 initially shouted "STOP", subsequently shouted "STOP STOP STOP" and told the RCO to get the stretcher and med pack.

Witness 13
Witness 1

Witness 9
Witness 11

Witness 1

Immediate Action

1.3.54 As SS1 ran to Pte McPherson, he could not see an obvious wound because of Pte McPherson's helmet and LUCIE NVG but saw blood coming from underneath his helmet. SS2 ran over to assist thinking it may be a broken leg. Once SS2 arrived at Pte McPherson, he told the remainder of the FT to sit and face down the range as he did not want them to see the extent of Pte McPherson's injuries. The RCO and TO immediately moved down to the accident location, the TO having picked up the stretcher on the way. The SPO took it upon himself, as the senior rank at the range, to call Range Control on the range hut telephone. The Range Control Operative received the emergency call from Heely Dod Range at 2300. After the accident had occurred, Firer 4 told the remainder of the FT to take their kit off, placing it where they stood, as he remembered this protocol from the safety brief. The purpose of this was to assist identifying where personnel were located at the time of the accident. The Range Control Operative called the emergency services at 2303.

Witness 9
Witness 10

Witness 10

Witness 9
Witness 1
Exhibit 53

Witness 13

1.3.55 Once the RCO and TO arrived at the accident location with the stretcher, they used white light (torch) and First Field Dressings, from individuals on the range, as there was difficulty in locating the range medical pack. SS1, SS2, RCO and TO then placed Pte McPherson on the stretcher and carried him up the hill to the road outside the range hut. Once there, the TO commenced Cardiopulmonary Resuscitation (CPR), whilst SS1 and SS2 tended to the wound. Whilst first aid was being administered, the SPO was told by range control that the emergency services would call him directly. Within 30 seconds of putting the phone down, the SPO received a call from the emergency services. The operative asked if the casualty was conscious and then told the SPO to begin giving CPR; this was already being conducted. After a few minutes, the RCO realised that the remainder of the FT were down on the range unsupervised with loaded weapons and so sent the Coy 2IC down to supervise.

Witness 1

Witness 6
Witness 6

Witness 1

Witness 6

Witness 9

1.3.56 It quickly became clear that Pte McPherson was in a critical condition so the SPO relayed this onto the emergency services and requested an air ambulance. This was declined by the emergency services as the air ambulance did not operate at night within Northumberland, Durham or Cumbria. The civilian ambulance was sent to RV Alpha (Figure 7) and A Coy CSM was sent to meet the ambulance and escort it to the range. At approximately 2320, the SPO realised that Bn HQ was unaware of the accident as he noted there was limited traffic on Airwaves⁶⁰. He wanted to use Airwaves to inform Bn HQ but was concerned for

Witness 1

Witness 28
Witness 3

Witness 1

⁶⁰ Airwave radios operate on the Airwave network which is a mobile communications network used by the emergency services throughout the UK.

other soldiers finding out and informing people outside of the Bn. Instead he called the Bn 2IC via mobile phone comms. The CMT was informed of the accident, by 3 SCOTS Ops Rm, at 2328 and arrived at 2335 with the BFA. The civilian ambulance arrived a few minutes later at 2337 and pronounced Pte McPherson dead at the scene by the paramedic at 2345. The BFA located 3km away (Figure 7), arrived at the range approximately 38 minutes after the accident occurred.

Exhibit 20
Witness 1
Exhibit 1,
Exhibit 259
Exhibit 53
Exhibit 25

Follow Up Action / Post Accident Events

1.3.57 After Pte McPherson's status had been confirmed, the Ammo SNCO confiscated all mobile telephones to prevent dissemination of information before Next of Kin could be informed. Following the accident, an SASC SMI arrived on the range and took initial statements from those directly involved. He then secured the scene to ensure evidence was not compromised.

Witness 14

Witness 1

1.3.58 Northumbria Police arrived at Otterburn Camp at 0030 and were escorted to Heely Dod Range where they took primacy and liaised with the SASC SMI. At 0225 the Defence Accident Investigation Branch (DAIB) informed Range Control that they were deploying with a team of investigators who would arrive mid-morning on 23 Aug 16. Upon arrival, the DAIB investigators liaised directly with Northumbria Police and the lead investigator unloaded all the weapons prior to the Police taking them as evidence.

Exhibit 53

Exhibit 53

1.3.59 The range team and firers involved in the accident were kept at Heely Dod Range whilst the police conducted their initial investigation. The Quartermaster had a meal brought out for them before they returned to Otterburn Camp. Those involved arrived back at Otterburn Camp between 0500-0530. They were then told to shower and all clothes were taken from them for police forensics. All involved were given initial Trauma Risk Management (TRiM)⁶¹ briefs the following day. 3 SCOTS departed OTA after completing phases 1&2 of Ex WS 16/4 and transited to SPTA on 3 Sep 16 for phases 3&4.

Witness 13

Witness 13

Witness 13

Witness 10

Exhibit 43

Timeline of Events

Date	Time	Event
8 Mar 16	-	51 Bde Planning Conference
10 May 16	-	3 SCOTS Recce for Ex WS 16/4
17 Aug 16	-	Advance party and senior RCOs deploy
18 Aug 16	-	Vehicles deploy for Ex WS 16/4
19 Aug 16	-	Vehicles arrive at OTA for Ex WS 16/4
20 Aug 16	-	Main Body deploys for Ex WS 16/4
21 Aug 16	-	Recces and Range planning by SPO, PO & RCO
22 Aug 16	0600	Reveille
22 Aug 16	0800	3 PI depart Otterburn Camp
22 Aug 16	0830	1 PI depart Otterburn Camp by foot
22 Aug 16	0845	3 PI Foxhounds arrive at Leaguer point
22 Aug 16	1000	1 and 3 PIs arrive at Heely Dod range
22 Aug 16	1026	Clearance to fire given to RCO

⁶¹ TRiM is a method of secondary PTSD (and other traumatic stress related mental health disorders) prevention. The TRiM process enables non-healthcare staff to monitor and manage colleagues.

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22 Aug 16	1027	Static shoots commence
22 Aug 16	1300	Lunch
22 Aug 16	1330	Individual CQB and Individual F & M commence
22 Aug 16	1430	FT by day commences
22 Aug 16	1700	Mandated Check Fire
22 Aug 16	2000	FT by day continues
22 Aug 16	2100	LNV and night sight zero commences
22 Aug 16	2200	FT by night commences
22 Aug 16	2257	Ex stopped
22 Aug 16	2300	Range Control operative informed of accident
22 Aug 16	2303	Range Control inform emergency services
22 Aug 16	2320	Bn HQ and BFA informed of accident
22 Aug 16	2335	BFA arrives at Heely Dod Range
22 Aug 16	2337	Emergency Services Rapid Response arrives
22 Aug 16	2345	Pte McPherson pronounced dead
23 Aug 16	0030	Northumbria Police arrive at Heely Dod Range
23 Aug 16	0225	DAIB deploy to Heely Dod Range from Andover

Cause of Death

1.3.60 It was confirmed by post mortem that Pte McPherson received an unsurvivable [REDACTED] injury, which was entirely consistent with a gunshot wound [REDACTED]. Pte McPherson's funeral took place on 10 Sep 16.

Exhibit 157



PART 1.4 – ANALYSIS AND FINDINGS

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Introduction

1.4.1 The Black Watch 3rd Battalion Royal Regiment of Scotland (3 SCOTS) SI was convened on 30 Aug 16 to investigate the circumstances surrounding the death of Pte McPherson, who was shot and fatally wounded during a Live Fire Tactical Training (LFTT) exercise at Otterburn Training Area (OTA) on 22 Aug 16 at 2257. The SI initially focussed on the planning, preparation and execution of the LFTT exercise as directed in the Terms of Reference (TOR). However, it quickly became apparent that this focus would need to be broadened to capture the affects that policy and organisational influences, may have had, in order to help prevent a similar accident or incident in the future.

Exhibit 248

1.4.2 The Panel had access to all those involved in the planning, preparation and execution of the LFTT exercise, as well as those who participated on the day. Due to the nature of the accident, the majority of the evidence was drawn from interviews conducted by the Panel. Additionally, the Panel were given access to the initial interviews conducted by Northumbria Police, which provided an understanding of the accident prior to conducting their own interviews. The information gained through the interviews was supplemented by, and cross referenced against, extant policies and procedures, Subject Matter Expert (SME) opinion, documentary and medical evidence.

Exhibit 1

1.4.3 Below is a table of the key events leading up to, during and post the accident.

Ser	Date	Time	Event
1	8 Mar 16	-	HQ 51 Infantry Brigade (Inf Bde) planning conference
2	10 May 16	-	3 SCOTS Recce for Ex WS 16/4
3	17 Aug 16	-	Advance party and senior RCOs deploy
4	18 Aug 16	-	Vehicles deploy for Ex WS 16/4
5	19 Aug 16	-	Vehicles arrive at OTA for Ex WS 16/4
6	20 Aug 16	-	Main Body deploys for Ex WS 16/4
7	21 Aug 16	-	Recces and Range planning by SPO, PO & RCO
8	22 Aug 16	0600	Reveille
9	22 Aug 16	0800	3 PI depart Otterburn Camp in FOXHOUND
10	22 Aug 16	0830	1 PI depart Otterburn Camp on foot
11	22 Aug 16	0845	3 PI arrive at Leaguer point
12	22 Aug 16	1000	1 and 3 PIs arrive at Heely Dod Range
13	22 Aug 16	1026	Clearance to fire given to RCO
14	22 Aug 16	1027	Static shoots commence
15	22 Aug 16	1300	Lunch
16	22 Aug 16	1330	Individual (Ind) CQB and Ind F & M commence
17	22 Aug 16	1430	FT by day commences
18	22 Aug 16	1700	Mandated check fire
19	22 Aug 16	2000	FT by day continues
20	22 Aug 16	2100	Limit of Night Visibility (LNV) and night sight zero
21	22 Aug 16	2200	FT by night commences
22	22 Aug 16	2257	Pte McPherson was shot

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23	22 Aug 16	2300	Range Control operative informed of accident
24	22 Aug 16	2303	Range Control inform emergency services
25	22 Aug 16	2320	Bn HQ informed of accident
26	22 Aug 16	2328	Battle Field Ambulance (BFA) informed of accident
27	22 Aug 16	2335	BFA arrives at Heely Dod Range
28	22 Aug 16	2337	Emergency Services Rapid Response arrives
29	22 Aug 16	2345	Pte McPherson pronounced dead
30	23 Aug 16	0030	Northumbria Police arrive at Heely Dod Range
31	23 Aug 16	0225	DAIB commence deployment to Heely Dod Range

Methodology

1.4.4 **Accident Factors.** Once an accident factor had been determined it was then assigned to one the following categories:

- a. **Causal Factor.** Causal factors are those factors which, in isolation or in combination with other factors and contextual details, 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 Factor.** Contributory factors are those factors which made the accident more likely to happen. That is, they did not directly cause the accident, therefore if a contributory factor is removed from the accident sequence, the accident may still have occurred.
- c. **Aggravating Factor.** Aggravating factors are those factors which made the final outcome of an accident worse. However aggravating factors do not cause or contribute to an accident, that is, in the absence of the aggravating factor, the accident would still have occurred.
- d. **Other Factor.** Other factors are those factors which, whilst they played no part in the accident in question, are noteworthy in that they could contribute to or cause a future accident. Typically, other factors would provide the basis for additional recommendations or observations.
- e. **Observations.** Observations are points or issues worthy of note to improve working practices that the SI panel discovered during their investigation, but that do not relate directly to the accident being investigated.

Human Factors (HF)

1.4.5 A psychologist from the Directorate of Personnel Capability (DPers Cap) Army HQ provided HF specialist support to the SI. This included participation during interviews, production of a report, discussion and advice to the Panel throughout. The observations in the main SI Report have taken into account the HF component.

Exhibit 211

OFFICIAL SENSITIVE

1.4.6 **Available Evidence.** The Panel had access to the following evidence:

- a. Interviews with the safety staff, firers, 3 SCOTS Chain of Command, OTA Staff and other witnesses.
- b. Formal statements from witnesses.
- c. Photography and mapping from several sources.
- d. HF Report provided by DPers Cap.
- e. Relevant standing orders.
- f. TORs and documentation including the relevant Range Action Safety Plan (RASP), 906A, 906B, Ex Instruction.
- g. Training records and butt registers¹.
- h. DAIB Triage Report.
- i. Range safety including PAM 21 and Operational Shooting Policy (OSP).
- j. Defence Learning Environment (DLE) course for Senior Planning Officer.
- k. Evidence obtained and released to the SI by Special Investigation Branch and Northumbria Police.
- l. Pathologists Report released by Northumbria Coroners.
- m. Evidence gained from trial/reconstruction.

1.4.7 **Services.** The Panel was assisted by the following personnel and agencies:

- a. DAIB (Land).
- b. Capability Directorate Combat (CD Cbt).
- c. Infantry Battle School (IBS), Brecon.
- d. DPers Cap HF Specialist.
- e. Northumbria Police.
- f. HQ 51 Inf Bde.

¹ A butt register is a record of an individual's attendance at a range and their shooting standard attained.

- g. Lockheed Martin.
- h. Field Training Unit (FTU).
- i. Air Combat Service Support Unit (ACSSU) Photo Operations, RAF Halton.
- j. Infantry Training Centre (Catterick) (ITC(C)).
- k. Landmarc.
- l. Technical Advisory Section (TAS), Warminster.
- m. HQ Small Arms School Corps (SASC).

1.4.8 **Issues Considered by the Panel.** The Panel analysed the following issues:

- a. Firer/target identification.
- b. Night Vision Devices.
- c. Hearing Protection.
- d. Range safety and construction.
- e. Training progression.
 - (1) OSP.
 - (2) Organisational factors.
- f. Range safety communications/medical plan.

Determining the Cause of Death

1.4.9 There were 2 post-mortem examinations carried out on Pte McPherson's body. The first was conducted by an Honorary Consultant Forensic Pathologist working for the Home Office in the North East of England on 23 Aug 16. The second was carried out by an Honorary Consultant Histopathologist working for the Home Office in the North East of England on 31 Aug 16.

Exhibit 157

1.4.10 The Pathology Reports concluded that there was no obvious pre-existing natural disease and that Pte McPherson had sustained an un-survivable injury [REDACTED] consistent with a gunshot wound, which was established as the cause of death. The Report stated that there was no evidence to indicate foul play i.e. the deceased was not restrained at the time of death nor had he been assaulted prior to the accident.

Exhibit 157

1.4.11 Toxicological analysis was conducted on a blood sample. This sample was tested for the presence of alcohol, certain medications, a range of

Exhibit 157

commonly abused drugs and a wide range of other substances, including novel psychoactive substances such as synthetic cannabinoids and other “legal highs”. None of these substances were detected.

Analysis of Factors

1.4.12 A reconstruction of the accident was conducted at Heely Dod Range 7-9 Nov 16. The equipment and manpower was sourced externally to 3 SCOTS. Based on the evidence obtained and after extensive interviews, the reconstruction was coordinated by the Panel with assistance from the HF Psychologist and the DAIB Mentor. Although the light levels could not be exactly matched, the forecast light levels and weather conditions were similar to those on 22 Aug 16.

Exhibit 258

1.4.13 The reconstruction was supported by Photographers/Videographers of ACSSU, RAF Halton. They attended the reconstruction and recorded the findings through either video recordings or stills. The recordings were enhanced further by attaching a Helmet Mounted Night Vision System (HMNVS)² to the lens of the camera to ensure an accurate picture was captured (see Figures 3-7, 10, 23 and 24). Whilst deployed at OTA, the Panel recorded findings of individuals in alternative fire positions as well as running through different scenarios based on witness interviews.

Exhibit 211

Firer/Target Identification

1.4.14 The Panel investigated whether there was any difficulty in differentiating between the targetry used (Figure 11 targets³ (see Figure 1)) and firers during LFTT, in black light with no IR illumination⁴. This is pertinent due to the current practice of attaching IR Cyalumes⁵, onto the rear of the helmet, to mark the position of firers when conducting LFTT at night without illumination. **From witness interviews, information gained from the reconstruction at Heely Dod Range and analysis of the equipment, the Panel believes that it is highly likely that Firer 2 misidentified Pte McPherson for a target and fired the fatal round. The Panel considers this to be the Causal Factor.** This is analysed and explained further in the following paragraphs including an examination of the difficulty in differentiating between targets and firers during night LFTT without illumination including IR.

Exhibit 211

Witness 9
Witness 11

² A monocular image intensifier worn over the left eye.

³ A Fig. 11 target is the silhouette of a advancing soldier and measures 1145mm (H) x 455mm (W) and is a pre formed target made out of consumable material.

³ Marking firers with a form of IR light device helps mitigate the risks and hazards of the battlefield at night, or in limited visibility conditions.

⁴ This refers to no additional illumination (white light or infra-red light) to assist vision at night; the firer and safety supervisors rely on their Night Vision Goggles to allow them to see.

⁵ A small plastic light stick, in the form of an IR Cyalume, is attached to the rear of the helmet to aid identification when viewed through a Night Vision Devices, such as a HMNVS.





Figure 1: Figure 11 target.

1.4.15 During training, soldiers are taught to fire at a human shaped target. The Panel considered that different shaped targets could be used during the early progression of night LFTT. This would ensure the silhouette of the target was clearly differentiated from a firer. By making these changes, the risk of mis-identification of targets and firers would be significantly reduced (see Figure 4).

Exhibit 260

1.4.16 Recruits are introduced to the figure 11 target at an early stage of marksmanship⁶ training. This is done to condition a soldier to shoot, if required, at a combatant during an operational deployment. Psychological studies have proved that if a soldier is not conditioned to shoot a human shaped target, there is a reluctance to carry out this action, in a timely fashion. When soldiers conduct marksmanship training, they are taught to aim at the centre of mass of the target from different firing positions. This enables them to select an appropriate fire position when advancing to LFTT shoots. All soldiers are taught to aim off a figure 11 target during windy conditions at set distances. This technique using a human shaped target directly translates to the battlefield and enables the soldier to accurately gauge the target in order to hit centre of mass.

1.4.17 Targetry and Human Factors experts consider that changing a figure 11 for a less human shaped target would reduce realism, disrupt marksmanship training principles and reduce the soldiers ability to engage targets effectively on operations. Training realism during LFTT is central to safe and professional performance in an operational theatre. It is the Panel's opinion that by changing the shape and dimensions of the target would adversely affect this skill.

1.4.18 During interview, Firer 2 stated that a target appeared approximately 5 metres to his front left. For reasons explained below, the Panel believe that this target was in fact Pte McPherson and Firer 2 fired at him in the mistaken belief he was a target. When the accident occurred Pte McPherson and Target 1 were forward and to the left of the remainder of the Fire Team (Figure 2). This led the Panel to investigate how a firer could be mistaken for a target at night without illumination. Target 1 has been examined by the manufacturer, Lockheed Martin

Exhibit 211
Witness 11

⁶ A marksman is a person who is skilled in precision shooting, using projectile weapons, usually with a rifle.

(LM), who confirmed that it was operating within the parameters of its specification. No other witness present at the range recalls seeing Target 1 appear at the time of the accident. This will be covered further in paragraphs 1.4.74 to 1.4.79.

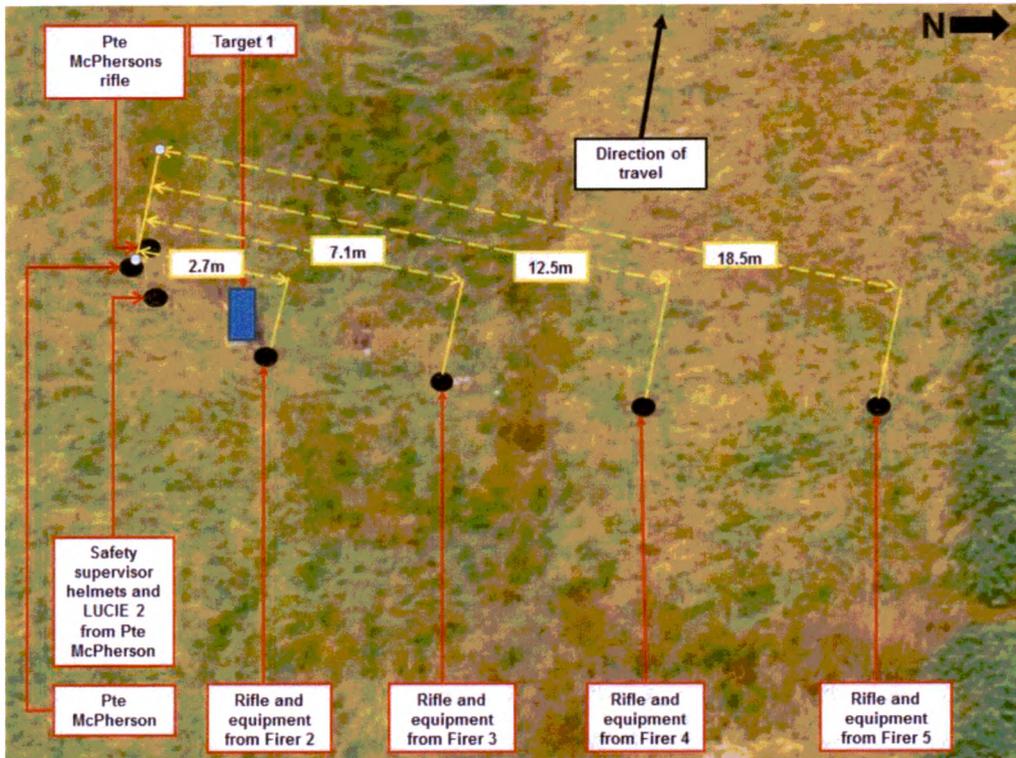


Figure 2: Layout of personal equipment as left at the accident location including distances.

1.4.19 During the reconstruction, the Panel, the HF Psychologist and the DAIB Lead Mentor were able to identify a number of factors which are discussed below. The reconstruction established that these factors could cause significant confusion for firers, in trying to differentiate between other firers and targets.

Exhibit 211

1.4.20 It was demonstrated during the reconstruction that when an IR Cyalume is fitted to the rear of a firer's helmet, with a slight turn of the head, the Cyalume can disappear from view to those personnel situated to the rear for the firer, i.e. safety supervisors or other firers, (Figures 3 and 4). Figure 5 also shows the similarity between a firer in the kneeling position and a figure 11 target when viewed through a HMNVS. If the IR Cyalume was not visible, a firer could easily mistake another person for a target. This is even more likely when the range participants are expecting a target in front of them.



Figure 3: Firer (left) in the kneeling position with his head facing away from the camera with a figure 11 target (right) in the foreground.

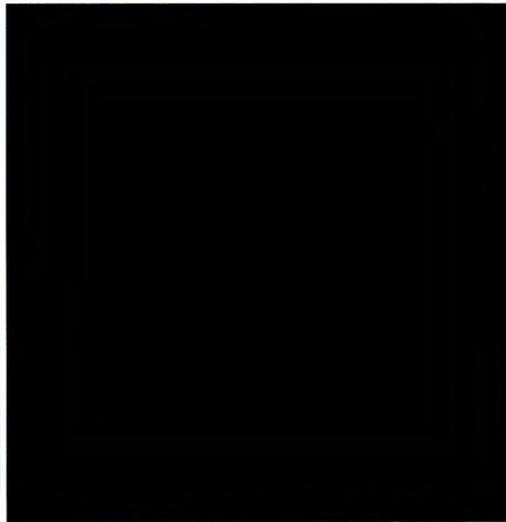


Figure 4: Firer (left) in the kneeling position with his head facing towards the camera with a figure 11 target (right) in the foreground.

1.4.21 The reconstruction also identified a second issue: this was the difficulty in differentiating between a firer wearing a Cyalume and a figure 11 target being illuminated by a IR marker, from a LLM Mk 3⁷, when in close proximity (see Figure 5).



Figure 5: Similarities between a figure 11 target with an IR marker next to a firer. 5

1.4.22 During interview, Firer 2 recalled that he had fired at a target 5m to his forward left. Target 2 was in fact 50m to his forward right (see Figure 11). He stated that he had been surprised that Pte McPherson had moved from beside him to in front of him. The Panel therefore believes that it is highly likely that Firer 2 misidentified Pte McPherson for a target and fired the fatal round and concludes that this was the **Causal Factor**. The Panel believe this is as a result of the

Witness 11

⁷ A device fitted to a rifle that when collimated allows the operator to mark targets in the IR and visible spectrum to allow for shoulder controlled aimed shots.

difficulties associated with differentiating between targets and firers during black light with no IR illumination (Figure 5). This led the Panel to examine how firers were marked during this LFTT exercise.

1.4.23 In Figure 6 a representation, during a trial conducted by the Panel, of how the firers and safety supervisors were marked. All firers are in a kneeling position (with 1 Cyalume on rear of helmet) and SS1 (2 Cyalumes on rear of helmet) is standing. For this trial, Firer 2 is aiming his LLM Mk 3 at target 1. The small dots beyond the target are the laser projecting through bullet holes on a previously used target. The photograph was taken through a HMNVS 10m to the rear and demonstrates the difficulty of differentiating between firers, safety supervisors and targets using this commonly used system.

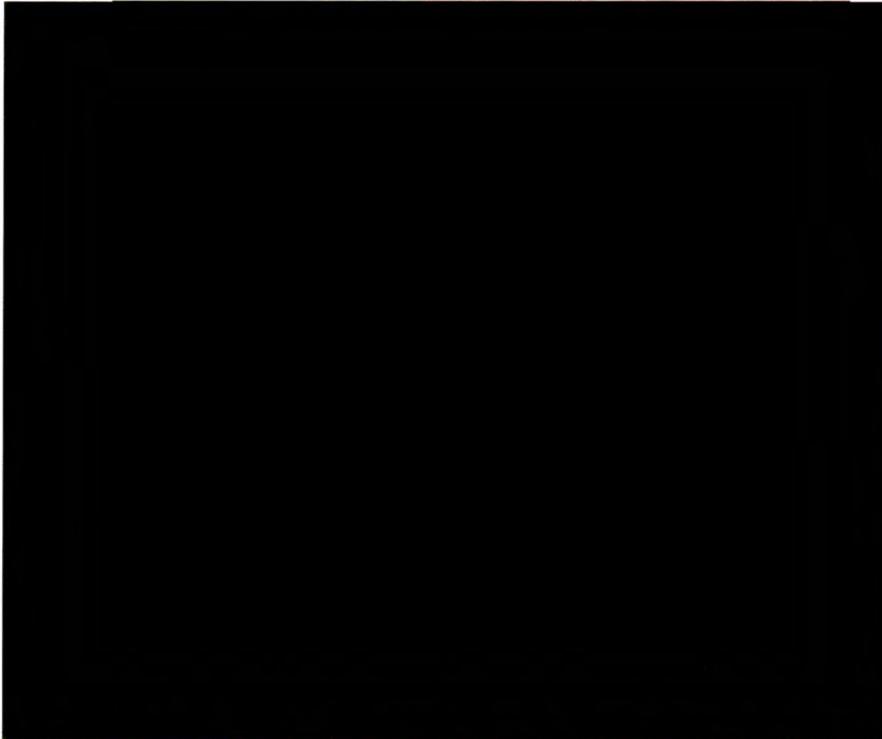


Figure 6: The similarities between a figure 11 target marked with a LLM Mk 3 marker and multiple firers marked with IR Cyalumes approximately 10m from the camera lens.

1.4.24 When the Panel visited Infantry Weapons Division, IBS Brecon in Oct 16, it was noted that they had started to use one IR Cyalume in the helmet with a second located in the back of the webbing as best practice in an attempt to reduce the risk. By using 2 Cyalumes in this way (see Figure 7), the risk of losing sight of the IR Cyalume when the head or body is turned is reduced. In addition, by having an IR Cyalume in the centre of the webbing and one on the rear of the helmet also gives an indication of which direction the firer is facing.

Exhibit 142



Figure 7: From left to right - View of a figure 11 target, firer with an IR Cyalume in the helmet, firer with an IR Cyalume in the helmet and webbing and a firer with 2 IR Cyalumes in the helmet.

1.4.25 **Recommendation.** Head of Capability Combat (HoC Cbt) should take action to improve personnel identification, when conducting LFTT at night without illumination, in order to reduce the risk of personnel being mistaken for targets.

Thermal Sights and Thermal Targetry

1.4.26 When the accident occurred, Firer 3 had a VIPR TI⁸ sight fitted to his weapon system; however, there were no thermal shrouding or electronically heated targets used, therefore the VIPR TI sight was rendered ineffective.

Witness 12

1.4.27 Firer 3 (as well as Firers 2 and 4 on previous detail) was issued with a VIPR TI Sight as his only means of night vision. Therefore the only way for him to view the difference between a target and a firer was to point his weapon system towards another firer, as the VIPR TI is attached to the weapon system and the firer and he had no other NVD. This would be a dangerous action and is not taught or practiced. The primary means of target indication being used was the LLM Mk 3. As a consequence Firer 3, without HMNVS, could not clearly identify any targets or other firers and therefore did not fire during the practice.

Exhibit 1

Witness 12

1.4.28 At the time of the accident, PAM 21 stated "All personnel must wear and be competent with HMNVS or other Night Vision Devices (NVD)" when conducting night firing without illumination (including IR light). Additionally, it stated that consideration should be given to "using a thermal patch where applicable", which would enable a firer to identify a target through a thermal sight. The Range Conducting Officer (RCO) was therefore not contravening policy by not employing thermal targetry as PAM 21 did not mandate its use. However, employing TI sights without also using thermal targetry is not considered best

Exhibit 207

Witness 12

⁸ An in service sight used in conjunction with the SA80 that enables soldiers to engage heat signatures accurately.

practice. A VIPR TI Sight is also a NVD, which would comply with PAM 21; however, without a HMNVS the target could not be clearly identified by the firer through the VIPR TI Sight, especially with targets being indicated with a LLM. By not using thermal targetry, Firer 3 could not identify targets and so was correct not to fire (see Figures 8 and 9). However, in the previous detail, Firers 2 and 4 did fire despite no thermal targets in use. The Panel therefore concludes that it is likely that future accidents could occur, when firers equipped with TI NVD, but no HMNVS, are conducting a LFTT range at night, with no thermal targets deployed. Lack of thermal targets, in conjunction with the use of VIPR TI, was therefore an **Other Factor**.



Figure 8: From left to right – View of a thermal target next to a figure 11 target.

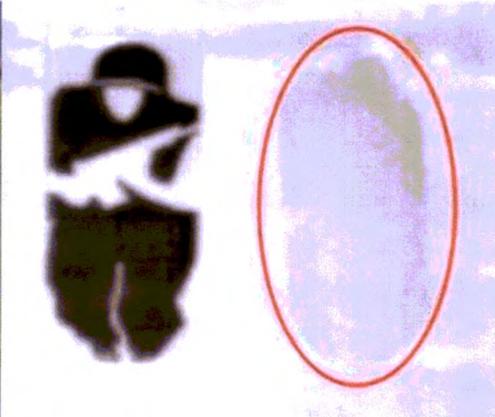


Figure 9: From left to right – View of a thermal target next to a figure 11 target through a TI NVD.

Exhibit 252

1.4.29 **Recommendation** – HoC Cbt should ensure that policy is introduced to match targets, NVDs and target marking devices in order to facilitate clear target identification.

Target Mechanism Power on Light at Night

1.4.30 The Small Arms Range Targetry System (SARTS)⁹ was in use at Heely Dod Range on 22 Aug 16 and was set up by the Range Warden, for the RCO, in the target pits requested. However, it is the responsibility of the RCO to ensure that all targetry is set up correctly, including the shielding of target power on light, prior to any form of LFTT.

Exhibit 116

Exhibit 5

1.4.31 Target 1 was isolated after the accident. Whilst the Panel was at the scene, the targetry was taken for analysis by MOD contractors and the equipment manufacturer. Upon initial observation of the SARTS equipment, by the Panel, it was apparent that the power on light on the side of the target mechanism had not been covered and would have emitted a light at night when LFTT ranges were taking place. At the time of the accident, PAM 21 stated that “any power on or equipment in use lights fitted to the target mechanism are to be removed or covered, using tape”. This direction was not followed. Figure 10 demonstrates

Exhibit 238

Exhibit 185

Exhibit 207

⁹ SARTS is a Windows based targetry system which is integrated into Live Firing Marksmanship Training (LFMT) and LFTT ranges.

the light that is emitted from the side of the target mechanism when it has not been covered. It was **observed** that, this emitted light could cause confusion to firers advancing down a range.

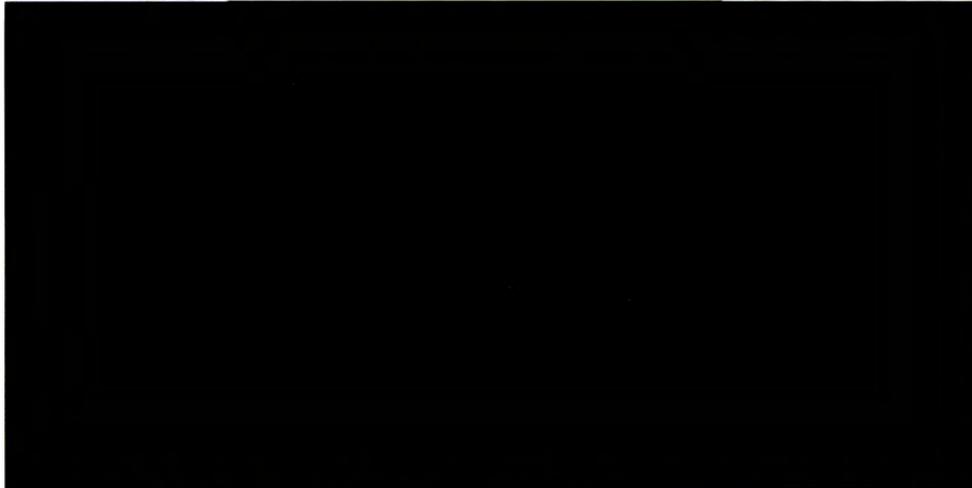


Figure 10: Figure 11 target connected to a SARTS target mechanism with the un-covered power light on the side of the mechanism.

LLM Training

1.4.32 During interview, it became apparent that A Coy personnel were only issued with the LLM Mk 3 upon arrival at OTA. The Coy received the LLM Mk 3, as a direct replacement of the LLM Mk 2, on 27 Jul 16 but with summer leave there was little time to train with the equipment prior to Ex WESSEX STORM 16/4. IBS issued a loose minute on 7 Nov 14 covering the issue of the LLM Mk 3 Safety Handling and Instruction Manual, of which copies were held within 3 SCOTS. LLM Mk3 training should consist of 4 x 40 minute lesson periods. The Panel could find no evidence that this training was delivered to those involved in the accident. This could lead to confusion in the correct use of the system. The lack of training was an **Other Factor**.

Exhibit 199

Exhibit 208

Exhibit 199

Night Vision Devices (NVD) - Use of LUCIE¹⁰ NVG

1.4.33 Pte McPherson was wearing LUCIE NVG when the accident occurred. The Safety and Environmental Case Report (SECR)¹¹, produced by Defence Equipment and Support (DE&S), states that LUCIE NVG is not cleared for use during Dismounted Close Combat (DCC) LFTT. Therefore, this equipment should not have been used at Heely Dod Range. The SECR identified that, when in use, the LUCIE NVG shrouds the eyes, impairing peripheral vision and reducing the field of view¹². LUCIE NVG is bi-ocular, not binocular; they provide the same image to both eyes, limiting depth perception. However, the direction

Exhibit 1

Exhibit 127

¹⁰ Universal night vision goggles used by drivers.

¹¹ DE&S LUCIE Goggles Safety & Environmental Case Report (SECR) dated Jan 16.

¹² The LUCIE has a 51 degree field of view.

OFFICIAL SENSITIVE

given in the SECR is not contained in the more widely referenced and accessible Surveillance Target Acquisition (STA) Pamphlet¹³ or PAM 21, to which the RCO would have access.

1.4.34 A Fire Control Order (FCO)¹⁴ was issued by Firer 4, but Firers 2 and 3 were unable to identify the target. The Panel believes that Pte McPherson identified Target 2 and inadvertently moved into the field of view of Firer 2. His movement was amplified due to the slope naturally drawing him downhill, to the right, as he focused on the second target as shown in Figure 11.

Exhibit 215

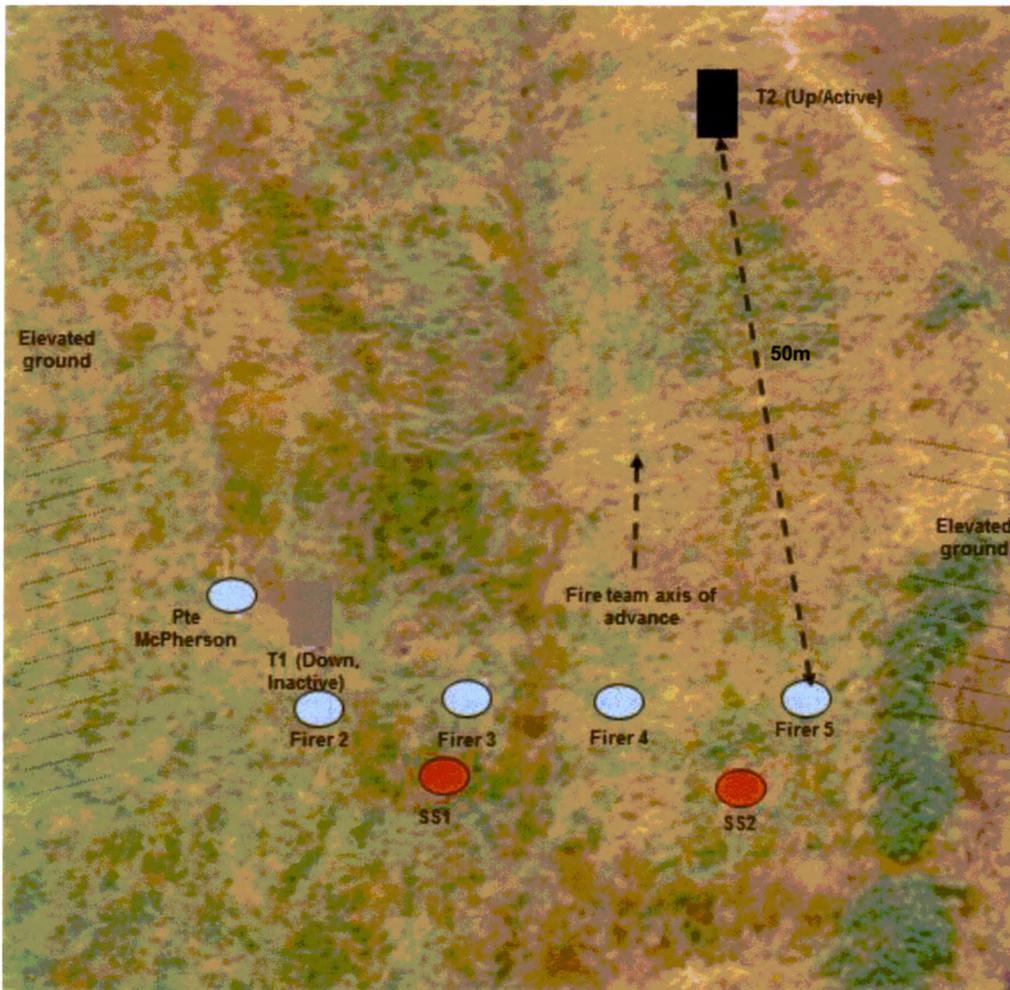


Figure 11: Positions of FT members, safety supervisors and targets on Heely Dod range at the time of the accident.

1.4.35 The field of view for LUCIE NVG is wider than HMNVS (51° vs 40°); however, with both eyes shrouded, there is a loss of peripheral vision (see Figure 12). The HMNVS is a monocular system mounted over the left eye. This allows

¹³ Capability Directorate Combat Dismounted Close Combat Training - Volume VI ISTAR - Section & Platoon Surveillance Target Acquisition Equipment - 2015.

¹⁴ A FCO is given so that the firer can recognise the target and fire at it effectively.

the left eye to acquire targets, whilst the right eye is free to work with the weapon system and assist with peripheral vision¹⁵. PAM 21 states that HMNVS or other NVD must be used when conducting DCC LFTT at night without illumination. The Panel believes that the use of LUCIE NVG in the DCC LFTT role was a **Contributory Factor** as it would have given Pte McPherson tunnel vision¹⁶ when he identified Target 2 (see Figure 11).

Exhibit 207

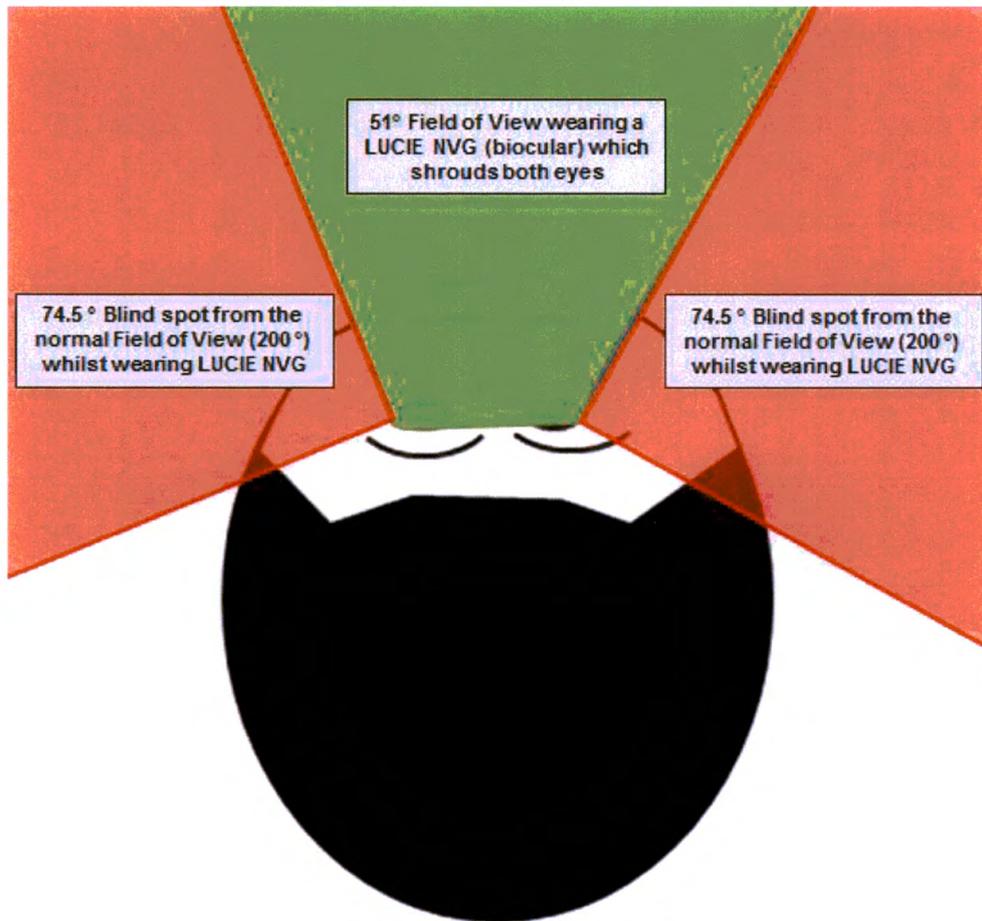


Figure 12: The view a firer would have using LUCIE NVG (biocular) with 51° field of view covering both eyes.

1.4.36 **Recommendation.** HoC Cbt should amend Volume VI ISTAR - Sect & PI Surveillance Target Acquisition Equipment and PAM 21 to accurately reflect the SECR direction for all in-service NVD, in order to inform the user of their limitations during DCC.

¹⁵ Despite having only a 40 degree field of view HMNVS facilitates greater situational awareness through less shrouding and the uncovered right eye.

¹⁶ Tunnel vision is the loss of peripheral vision with retention of central vision, resulting in a constricted circular tunnel-like field of view.

Night Vision Devices (NVD) - Use of HMNVS

1.4.37 SS1 and SS2 were using HMNVS fitted to their helmets, over their left eye, whilst conducting their duties. SS1 was responsible for the safety of Pte McPherson, Firer 2 and Firer 3 whilst SS2 was responsible for Firers 4 and 5. The Panel has analysed the field of view provided by HMNVS and the effect this has on range safety supervision. There is significant loss of situational awareness when a safety supervisor uses a HMNVS as explained in paragraphs 35-39 below.

Witness 10
Witness 9

1.4.38 Binocular overlap¹⁷ refers to the visible overlapping portion between the two eyes of a stereoscopic vision system (Figure 13). It describes how much of the viewed scene can be seen by both eyes as opposed to by just one of the eyes. The total field of view varies from person to person, but typically extends to 200°. The binocular overlap region is 120° and since each eye can see about 160°, the binocular overlap is 120/160 equating to 75%. Binocular overlap is particularly important for depth perception. When the brain sees an object with both eyes, the relative angles in which this object is visible give an estimate of how far away this object is located. If the object is far away, the angle in which it is seen by both eyes is practically the same. If the object is very close, the angles are very different.

Exhibit 237

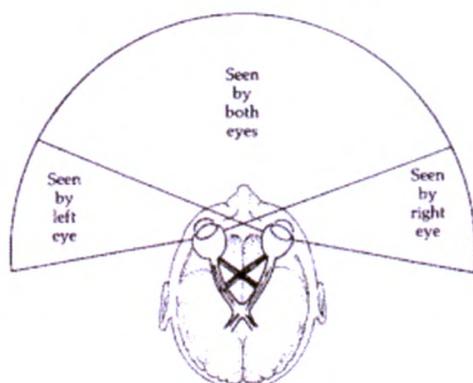


Figure 13: Binocular overlap

1.4.39 With the field of view approximately 200°, when no obstruction/NVD is obscuring the view (Figure 13), peripheral vision can be maintained. Both safety supervisors were wearing HMNVS along with Firers 2, 4 and 5. SS1 and Firer 2 had a restricted view to the left; the direction that Pte McPherson was coming from. The Panel believes that Pte McPherson entered the field of view of Firer 2, who instinctively fired, mistaking him for an appearing target. This instinctive reaction was more likely as Firer 4 had just given a target indication to the front, so Firer 2 was expecting a target to appear.

Exhibit 237
Exhibit 127

¹⁷ <http://vrguy.blogspot.co.uk/2013/05/what-is-binocular-overlap-and-why.htm>

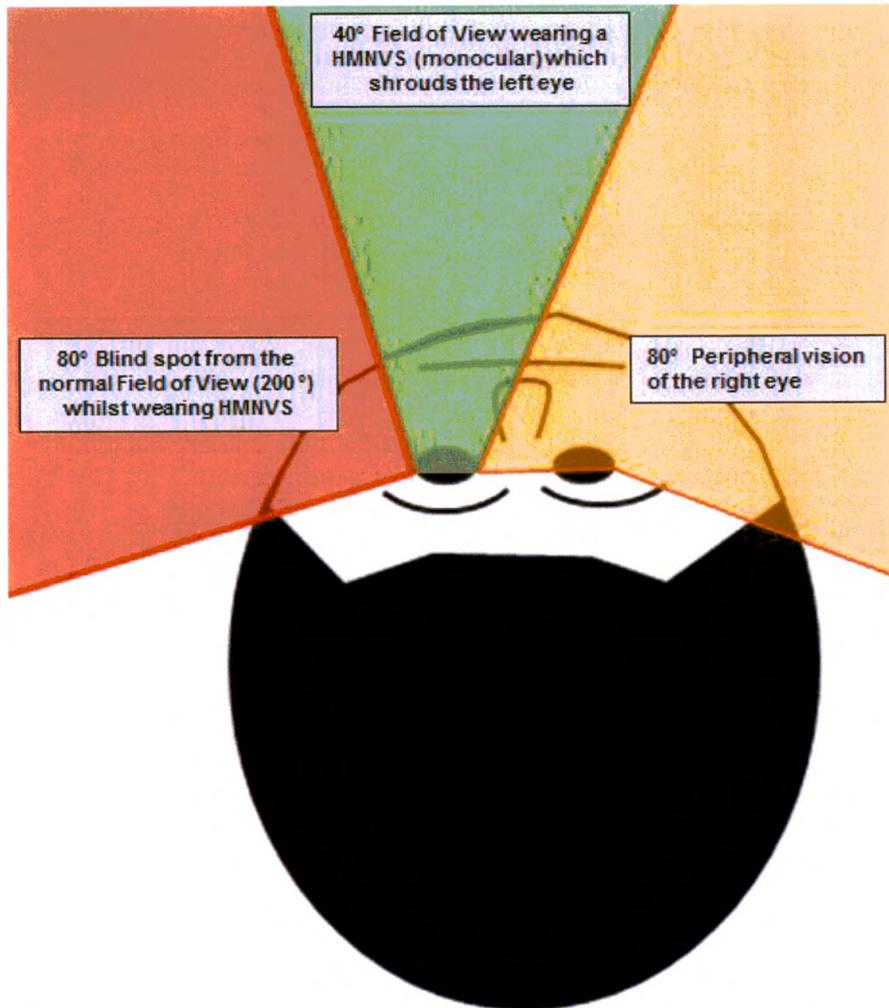


Figure 14: The view a firer would have using HMNVS (monocular) with 40° field of view covering the left eye only.

Night Vision Devices (NVD) - Use of HMNVS by Safety Supervisors

1.4.40 From the reconstruction, the Panel has identified that when an HMNVS is worn, there is a significant blind spot to the left due to the HMNVS covering the left eye (see Figure 14). With the safety supervisors utilising HMNVS on the range, their ability to carry out their duties, as directed in PAM 21¹⁸, is considerably more difficult. SS1 was positioned on the right hand side of Firers 1 and 2 (Figures 16 to 18). His ability to observe or correct errors in their weapon drills and intervene swiftly if required, was made considerably more onerous, when compared to a daylight range. The Panel believes that SS1 had become focused forwards and to the right towards Target 2 and Firer 3; he was therefore less sure of Pte McPherson's location. When SS1 perceived that Firer

Exhibit 207

Witness 9

¹⁸ PAM 21 Ch7 Sec 3 0775e. They are aware of the location of other troops. If a Safety Supervisor is uncertain of the position of other troops, they are to stop their firer/group from firing.

2 was dropping behind in relation to Pte McPherson and Firer 3, instead of checking the 590 mil safety angle¹⁹ of Firer 2 he verbally prompted Firer 2 to move forward in line with the FT. During interview SS1 stated that he did not expect Firer 2 to fire when he did.

1.4.41 The safety angle²⁰ employed at Heely Dod Range on 22 Aug 16 was 590 milliradians (mils)²¹, which equates to 33°²². The safety supervisors were responsible for ensuring that the safety angle was applied to either side of each firer's barrel using hand angles (Figure 15). As the HMNVS has a 40° (711 mils) field of view, the safety supervisor is required to turn their head to ensure that the safety angle is applied on both sides of the firing line. This is the same when LFTT is conducted in daylight hours without a HMNVS fitted. The difference is that without a HMNVS fitted, during the day, the safety supervisor would have a wider field of view (200°) and no blind spot on his left side. In daylight the safety supervisor is able to identify any potential safety infringements more easily and intervene if necessary. With HMNVS, the field of view is significantly reduced and a blind spot is present to the left (Figures 16 to 18). This limitation could enable firers to move rapidly into the safety angle of another firer and therefore potentially his line of fire, without the safety supervisor being aware (Figures 21 to 23). This was made more likely due to the close proximity that the firers were to each other. The Panel believes that SS1 was unaware of Pte McPherson's location and his movement into the firing line of Firer 2. This was probably because he was focussed primarily on Target 2 and Firer 3's location, as this was the split between the 2 manoeuvring groups, where he perceived the greatest risk to be. Providing effective range safety supervision of firing, whilst wearing HMNVS, is considerably more difficult at night and was a **Contributory Factor** in the accident.

Witness 9

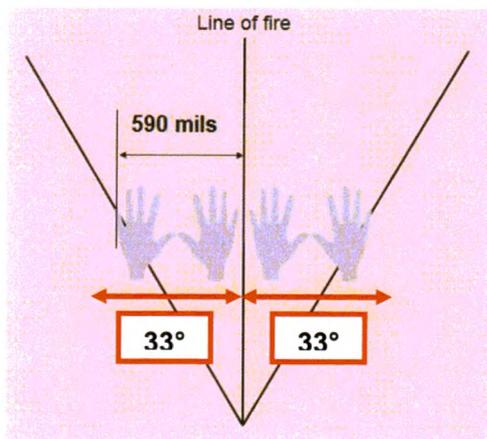


Figure 15: The use of hands to ensure the 590 mils/33° safety angle is adhered to on either side of the firer's line of fire.

¹⁹ This is a method of checking safety angles, using hands, which is explained further at paragraph 1.4.44.

²⁰ To ensure the safety of personnel, a safety angle is applied to either side of the weapon barrel/line of fire.

²¹ For precision, the military use mils for measuring angles. There are 6400 mils to a circle, As opposed to 360°.

²² $6400 \text{ mils} / 360^\circ \therefore 1^\circ = 17.77 \text{ mils}$. The safety angle of 590° equates to $590^\circ / 17.77 \text{ mils} = 33^\circ$.

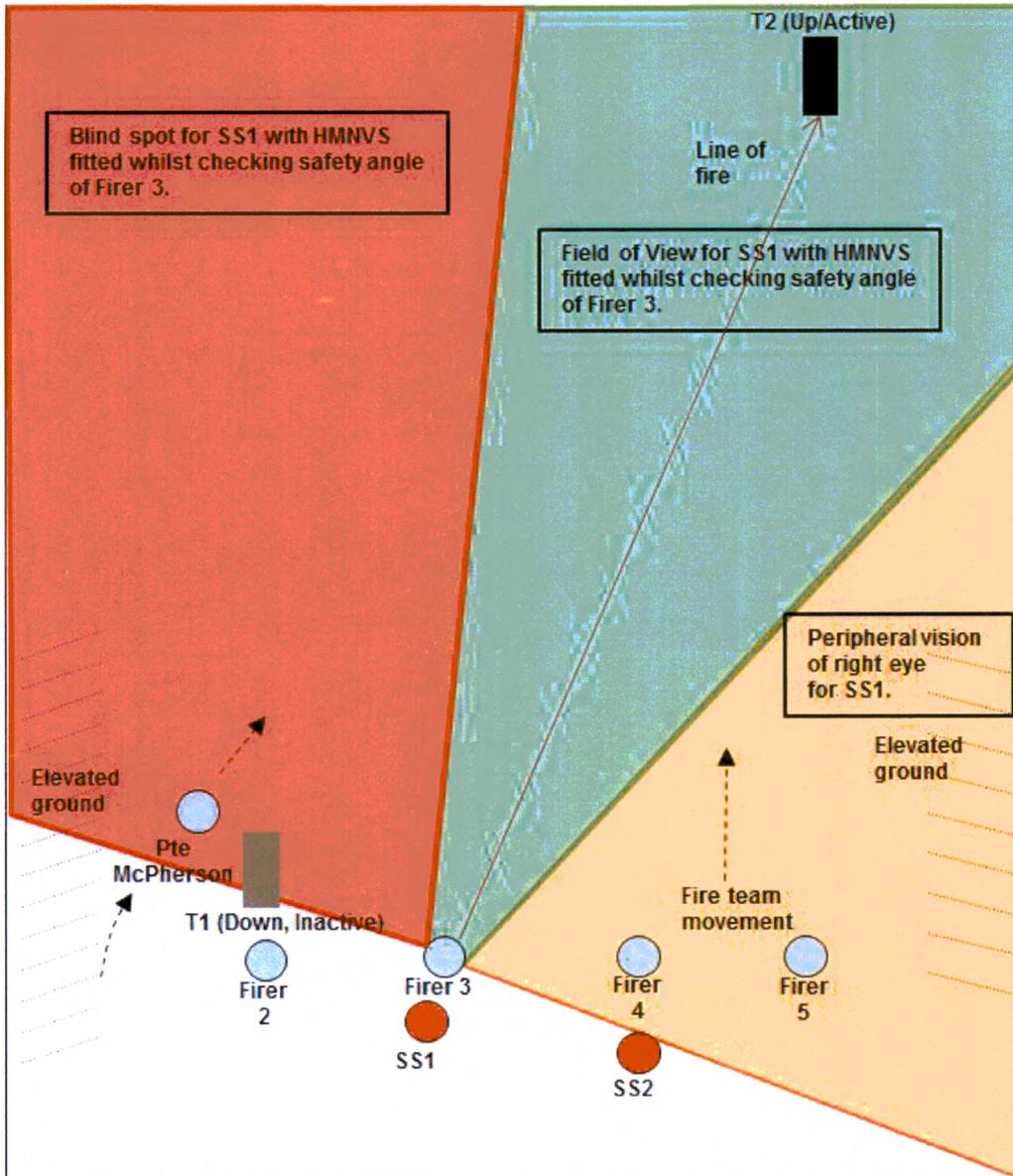


Figure 16: A representation of how SS1 could have limited field of view (40° field of view for HMNVS) of the firers to his left when looking down the line of fire of Firer 3 whilst using a HMNVS.

1.4.42 In order to maintain situational awareness, whilst wearing HMNVS, the safety supervisors and firers need to constantly observe right and left in order to cover a 200° (3554 mils) day time field of view. This action is vital for safety supervisors as they need to keep watch of all firers positions in relation to each other; however, when checking the 590 mils (33°) safety angle they need to keep their head stationary and focussed in one direction. During this short time it is possible for firers to encroach on the safety angle rapidly from the blind spot created by HMNVS (see Figures 17, 18 and 21).

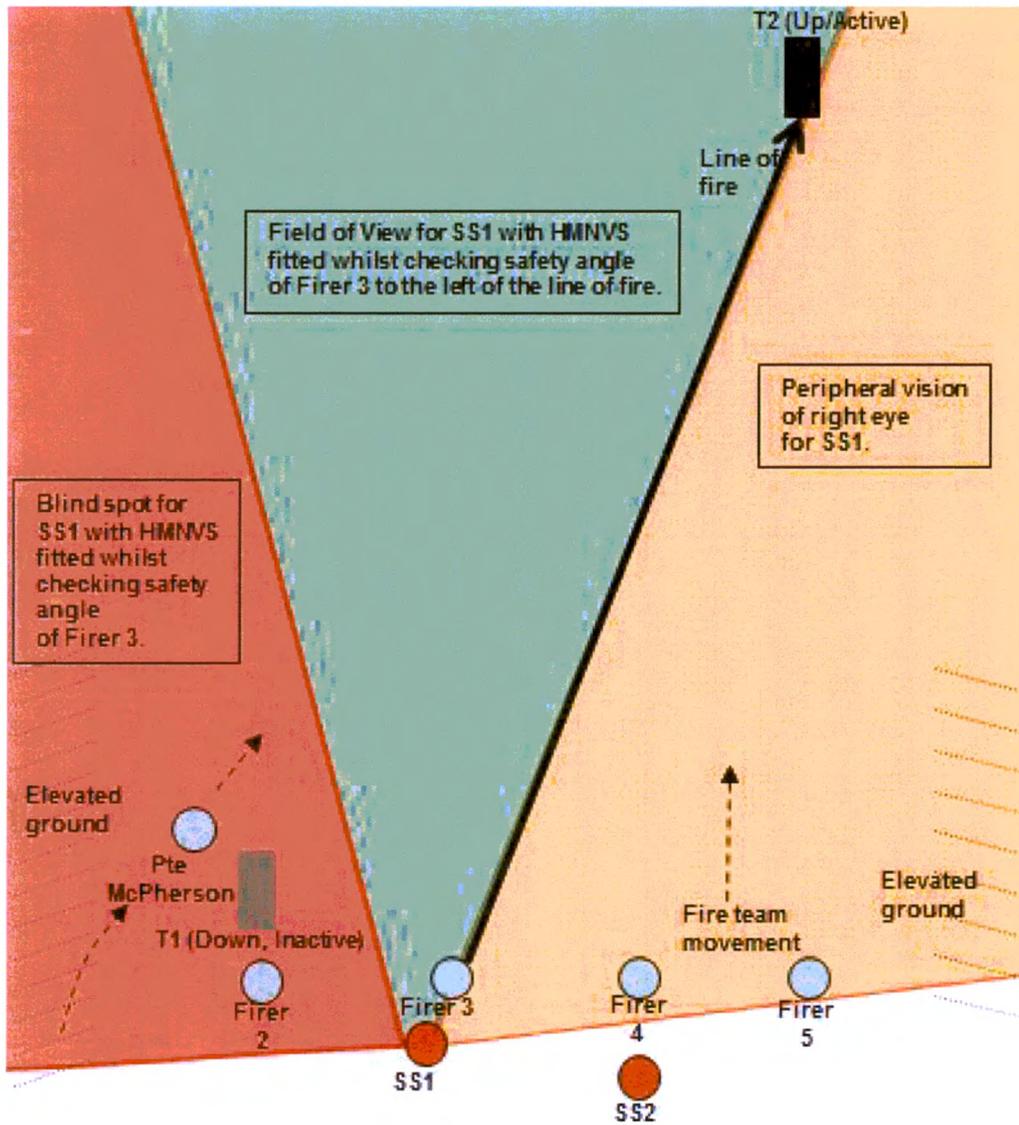


Figure 17: A representation of how SS1 could have a limited field of view (40° field of view for HMNVS) of the firers to his left when checking the safety angle of Firer 3 to the left of the line of fire whilst using a HMNVS.

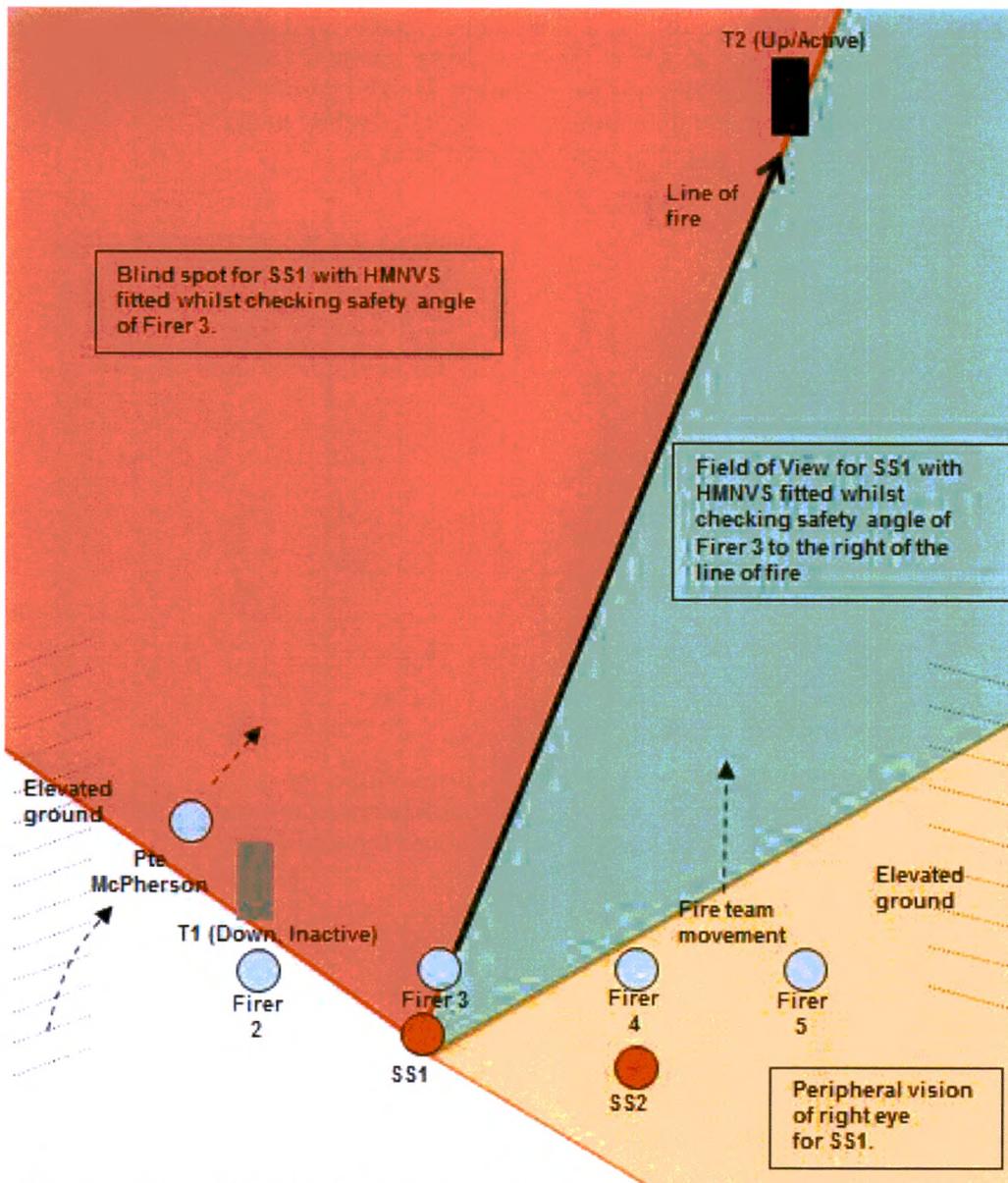


Figure 18: A representation of how SS1 could have a limited field of view (40° field of view for HMNVS) of the firers to his left when checking the safety angle of Firer 3 to the right of the line of fire and whilst using a HMNVS.

1.4.43 It would have been difficult for SS1, whilst wearing HMNVS, to accurately and swiftly locate Pte McPherson without deliberately turning his head to the left. Topography diagrams produced by the Health and Safety Executive have demonstrated that if Firer 2 was aiming at Target 2, he was in a safe firing position and no one was within his 590 mils (33) safety angle (Figure 19). They calculated that if the firers were 2.5 metres behind the final placements of equipment as depicted in Figure 1, the firers would have been closer to impeding the safety angle of 590 mils (Figure 20); the angle would reduce the further back the prediction was made. Figures 18 and 19 demonstrate that if all firers were

Exhibit 256

aiming at Target 2 (which was the only target in use at the time of the accident), Pte McPherson would not have been within any of the other firers' safety angle. The Panel concludes that the limited field of view, whilst wearing the HMNVS, combined with the need to pause all round observation, to check the safety angle of firers, **Contributed** towards a lack of effective supervision of Firer 2.

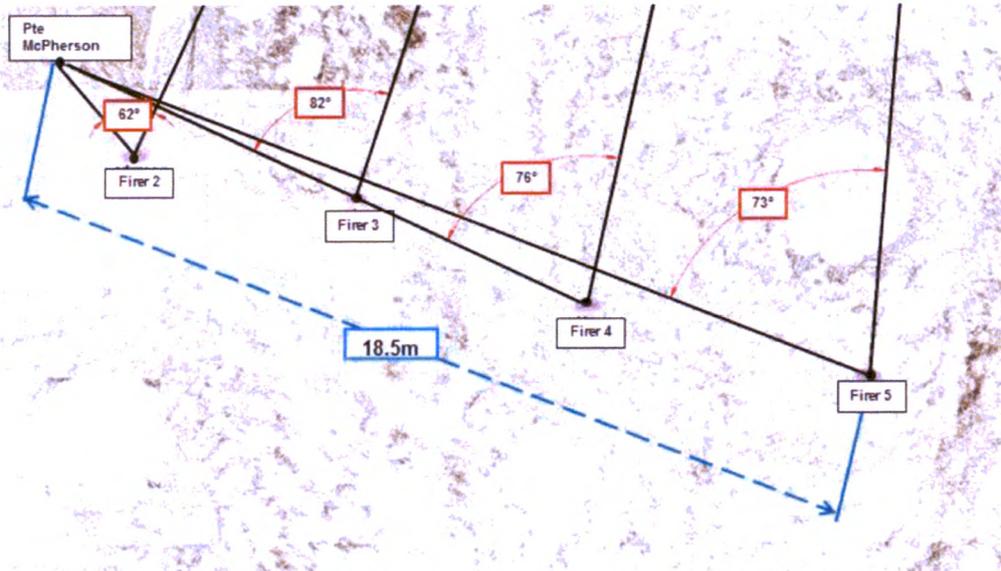


Figure 19: A Topography diagram demonstrating the predicted angles between Pte McPherson and each firer in relation to Target 2 (approximately 50m to the front) from the final position of the firers marked by wooden stakes.

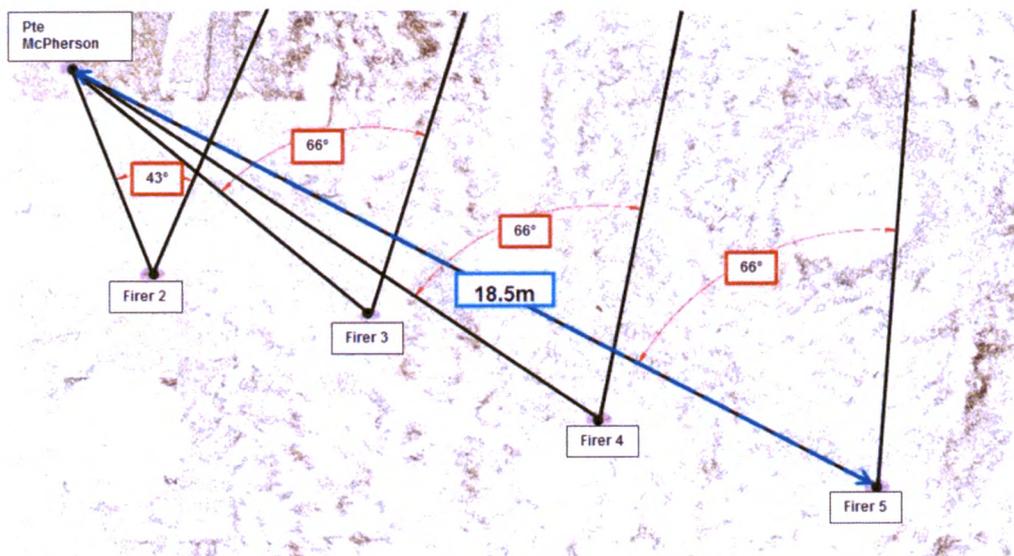


Figure 20: A Topography diagram demonstrating the predicted angles between Pte McPherson and each firer in relation to Target 2 from the position of firers moved 2.5 metres from wooden stakes.

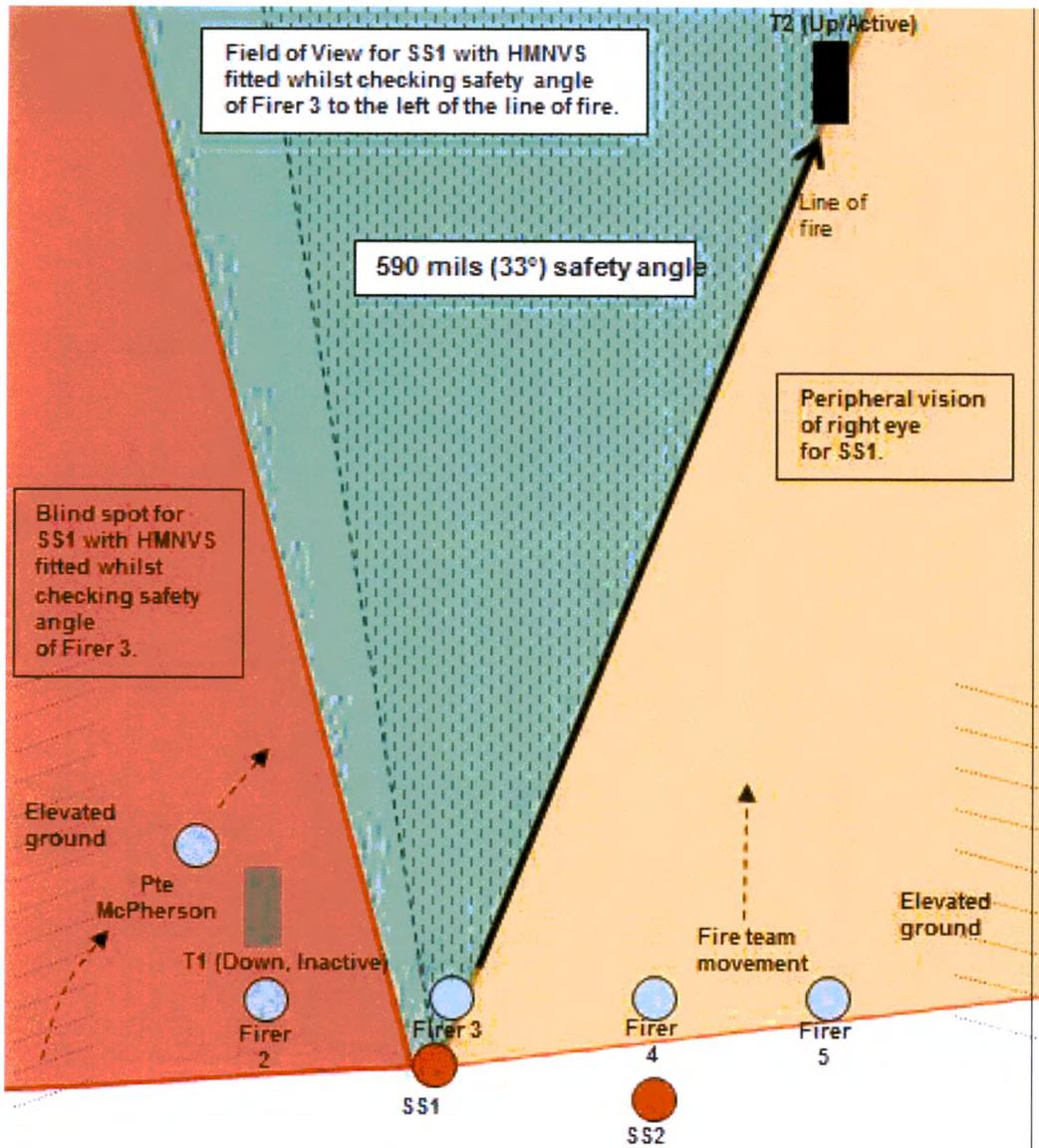


Figure 21: A representation of how difficult it is for SS1 to observe Firers 1 and 2 to his left, whilst applying the 590 mils (33°) safety angle wearing HMNVS.



Figure 22: A view through a normal camera lens of a 590 mils safety angle, marked out with mine tape, with a person stood as close to the line of fire permissible.

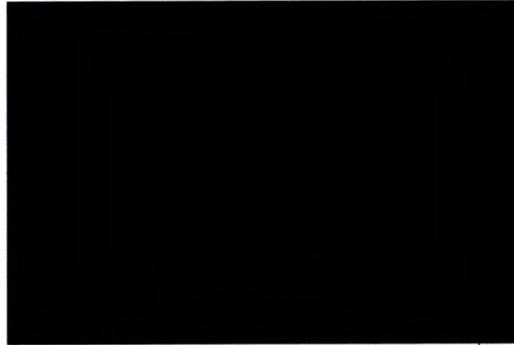


Figure 23: The same view as Figure 22, through an HMNVS, highlighting, how close to the line of fire a person can get without a safety supervisor noticing.

1.4.44 To ensure that the 590 mils safety angle is accurate, when a safety supervisor is carrying out their role on a range, they measure it against a pre marked safety angle prior to the range commencing. The safety supervisor compares the span of their hands against this angle. This then enables them to apply the safety angle on a range (Figure 20). This process instils confidence that their hand angles are accurate, in accordance with the 590 safety angle. At night, the same process is conducted; however, it is apparent that when wearing HMNVS, the safety supervisor could struggle to identify the safety angle from their hands as they are difficult to identify. Figure 24 demonstrates the difficulties in clearly identifying the hands and in turn the safety angle whilst wearing HMNVS. The Panel concludes that the difficulty in implementing hand angles whilst wearing HMNVS was a **Contributory Factor** in the accident.



Figure 24: View through a HMNVS of a safety supervisor demonstrating the difficulty using his hands to measure the safety angle.

1.4.45 All Panel members have experienced the safety supervisor training in professional capacity from a tri service background. The Panel believe that the courses are fit for purpose; however, it is considered that more emphasis could be placed on training safety supervisors to conduct their duties at night. This is especially pertinent during night firing without illumination.

1.4.46 **Recommendation.** Recognising that safety supervisors' vision and field of view are limited whilst wearing HMNVS, HoC Cbt should develop procedures that enable safety supervisors to **effectively** fulfil their duties during night LFTT.

Hearing Protection – Use of Peltor Ear Muffs

1.4.47 Pte McPherson was wearing issued Peltor Ear Muffs (Figure 25) when the accident occurred. Peltor Ear Muffs offer 'dumb' hearing protection, attenuating noise over a broad frequency range. Pte McPherson's lack of hearing was demonstrated at the ruined building (Figure 33) when the FT received Quick Battle Orders (QBO's) from Firer 4 (FT Comd). The FT was verbally asked to close in for the QBO's; however, Pte McPherson did not respond. Firer 2 then tapped him on the shoulder to gain his attention, after which Pte McPherson stood up and attempted to advance down the range by himself before being pulled back by Firer 2. It is assumed that he took the tap on the shoulder as a signal to move. The opinion of the Panel is Pte McPherson's actions indicate that he had difficulty in hearing whilst wearing Peltor Ear Muffs.

Exhibit 157

Witness 13



Figure 25: Peltor Ear Muffs

1.4.48 The Panel witnessed a clear demonstration of this during the reconstruction which showed how hard it is to hear when wearing with Peltor Ear Muffs. A role player equipped with Peltor Ear Muffs, who was receiving direction from the Panel, had persistent issues understanding and hearing voice commands. Eventually the role player had to lift the Peltor Ear Muffs off his ears so that he could listen to the voice commands from the Panel. Other role players, who were in the same location wearing Tactical Hearing Protection System Basic User (THPS BU), were able to clearly understand the same directions and voice commands given. On the night of the accident, SS2 was also wearing Peltor Ear Muffs. During interview SS2 had very little recollection of events leading up to the accident, despite detailed questioning from the Panel. SS2 informed the Panel that he struggled to hear anything whilst wearing Peltor Ear Muffs.

Witness 10

1.4.49 The Panel believe that Pte McPherson's movement, forward of Firer 2, was due to a lack of situational awareness created by the combined use of LUCIE NVG and Peltor Ear Muffs. Tunnel vision towards Target 2, together with impaired hearing caused by Peltor Ear Muffs and the natural downhill gradient, combined to draw Pte McPherson towards the target and forward left of Firer 2. It



is the view of the Panel that the effectiveness of Peltor Ear Muffs, in blocking background noise, led to Pte McPherson not sensing the movement of firers to his right hand side. The Panel considers that the continued use of Peltor Ear Muffs for LFTT is a potential safety hazard, when better alternatives such as the THPS BU are available. They are designed to provide hearing protection against impulse noise whilst also allowing communication. On this basis, the Panel believes the use of Peltor Ear Muffs to have been a **Contributory Factor** in the accident.

1.4.50 **Recommendation.** Recognising the noise attenuating properties of the Peltor Ear Muff, HOC Cbt should determine and direct which hearing protection systems are safe and suitable for use during DCC LFTT.

Hearing Protection – THPS BU Issue

1.4.51 Defence recently introduced the THPS BU. See figures 26, 27 and 28 for the 3 different systems of THPS BU that are currently issued to all combat units. THPS BU does not offer better hearing protection than the Peltor Ear Muffs or General Service Earplug; however, it does offer improved levels of hearing when used in the 'open' position. This will be covered further in para 1.4.51. After examining records, it was identified that Pte McPherson was not issued with THPS BU, unlike the majority of his Coy.

Exhibit 254

Exhibit 222



Figure 26: 3M CAEP v4.1



Figure 27: Surefire EP4



Figure 28: MCL TIPPS

1.4.52 Pte McPherson had been issued with Peltor Ear Muffs as well as 3M E-A-R Combat Arm Ear Plugs (Figure 29) hearing protection, which were an Urgent Operational Requirement (UOR)²³. The 3M E-A-R Combat Arm Ear Plugs were procured for operations in Afghanistan but are no longer issued to soldiers and are not a recognised form of hearing protection in PAM 21. The RCO had checked for hearing protection in line with PAM 21 and identified that all firers had "serviceable hearing protection", which included Peltor Ear Muffs.

Exhibit 222

²³ Supplementing the MOD's long term planned equipment program are UOR's, funded by extra Treasury money to provide the fast equipment solutions that address short falls against operational requirements.



Figure 29: 3M E-A-R CAEP

1.4.53 The Director General, Defence Safety Authority (DG DSA) published Urgent Safety Advice (USA) on 26 Sep 16 regarding the use of Peltor Ear Muffs during LFTT. The USA recommended that, if available, THPS BU should be used as a superior alternative to Peltor Ear Muffs. The Panel considers that the fact that Pte McPherson was not issued with THPS BU was a **Contributory Factor** as it resulted in him using Peltor Ear Muffs instead.

Hearing Protection – THPS user training

1.4.54 During the Panel's initial interviews, it became apparent that individuals were not clear how to use the THPS BU correctly. Additional user training should have been conducted but it appears this did not occur. Personnel from 3 SCOTS did have the THPS BU individually fitted (THPS BU come in 3 sizes; small, medium or large) and had to sign to confirm they received the hearing protection.

Witness 18
Witness 13

1.4.55 The 3 systems (Figures 26, 27 and 28) provide improved hearing by allowing the user to choose between two modes, open and closed, via either a plug or rocker switch. The open mode is used when situational awareness is a priority. In open mode the user will be protected from impulse noise (weapon fire); however, they will still be able to hear voice commands. Closed mode is used in continuous noise environments, such as in or around vehicles, to ensure all noise is muffled. Instructional videos have been produced for each THPS BU variant and can be found through Quick Response (QR) codes, which were placed on a hearing protection poster and distributed throughout 3 SCOTS barracks. The QR codes for the individual variants can be seen at figures 30, 31 and 32. Of the 9 firers interviewed (from Pte McPherson's FT and the previous detail), none of them had watched the training videos or were even aware of them. Only one of 9 had read the instruction manual issued with the hearing protection and a number of those interviewed did not understand the difference between the open and closed mode on the THPS BU. The Panel concludes that the confusion on how to use the THPS BU correctly was an **Other Factor**.



Figure 30: QR code for 3M CAEP v4.1 training.



Figure 31: QR code for Surefire EP4 training.



Figure 32: QR code for MCL TIPPS training.

1.4.56 **Recommendation.** HoC Cbt should take action to ensure that appropriate training on THPS BU is delivered to all soldiers issued with the system in order to ensure all soldiers are familiar with their effective use.

Range Safety and Construction – RASP Production

1.4.57 It is mandatory for a specific RASP²⁴ to be produced for each live firing activity. In addition to any verbal briefings, relevant parts of the RASP are to be issued to all staff employed on the exercise and to Range Control in accordance with Range Standing Orders. To provide assurance to the planning process, the RASP must be countersigned by the Senior Planning Officer (SPO). The RASP is documentary evidence that the planning process is followed by the Planning Officer (PO)/RCO in accordance with PAM 21.

Exhibit 207

1.4.58 Examination of the RASP produced for the 22 Aug 16, along with interview testimony, suggest that the document was out of sequence and lacking detail when compared with the template in PAM 21²⁵. The initial submission of the RASP, to OTA Range Control, resulted in rejection as it did not pass the Gross Error Checks; these checks reflect the division of responsibility between Safe Place²⁶ and Safe Practice²⁷. After re-submission, the RASP passed the Gross Error Checks, but in the Panel's opinion, it still lacked the structure defined in the PAM 21 RASP Template. The RASP should have included the names and appointments of all range safety staff, clearer night time control measures, more detail on the walk through (including triangulation of targets²⁸ and LNV) and a clearer sketch map. The RASP was signed by the PO; however, in accordance with PAM 21 it should have been the RCO.

Exhibit 241

²⁴ A mandatory safety document which details actions and procedures, which must be produced for all LFTT exercises.

²⁵ PAM 21 Ch7 LFTT RANGE ACTION AND SAFETY PLAN (RASP).

²⁶ Safe Place – Ranges, LFTT areas are properly prescribed clearly marked and conform to the design and safety criteria.

²⁷ Safe Practice – PAM 21 prescribes the rules and regulations for the planning, conduct and supervision of firing and training.

²⁸ PAM 21 Ch. 6 Sec 1 606q "Target triangulation is the process of establishing, on the ground, how far left or right and how close to a target a firer can engage, ensuring all shot and ricochets remain in the planned Range Danger Area (RDA)".



1.4.59 Originally, the PO was going to conduct both day and night ranges; however, after discussion with the SPO it was decided that the PO would only conduct the daytime range. OTA Range Control was not informed of this change and the RCO for the night range did not sign the RASP in accordance with PAM 21. When the night time RCO called through to Range Control to get authority to fire, OTA Range Control was under the impression that the PO was still responsible for the range. Lack of detailed planning, demonstrated by the RASP produced, was an **Other Factor** in the accident.

Witness 6
Witness 4

1.4.60 The submission of poor RASPs and lack of planning has been highlighted by the SASC and as a result an Electronic RASP (eRASP) has been trialled by Headquarters SASC. The current system entrusts the planning process to the individual and the only measure of their competence is the production of the paperwork. Greater assurance is required to demonstrate correct procedures have been adhered to. The new eRASP will enable a qualified PO to articulate their plan using a series of drop down boxes and free text options. This will compel the CoC to actively engage in the planning process by ensuring the eRASP originates with the SPO, is completed by the PO, authorised by the SPO and forwarded to the appropriate Range Authority. It will provide an auditable log ensuring it is clear who was involved with the planning process and each eRASP will be electronically archived for 10 years. This system will instil greater accountability ensuring the SPO, PO and RCO work together to correctly plan and conduct a range. The contract, to construct the software, went out to tender in May 16 with the completion date of Jan 17. The eRASP for all live/blank firing activities will be mandatory from Sep 17. The introduction of the eRASP will provide a solution to this issue and therefore the Panel makes no further recommendations.

Exhibit 242

Range Safety and Construction – Walk through

1.4.61 The walk through is an integral part of the LFTT activity which is mandatory and can take place up to 7 days before the specific LFTT range. It is during the walk through that every member of the range staff will find out the sequence of the exercise and the actions that they need to fulfil at every stage; it must be conducted by physically walking through the range. It is the responsibility of the RCO to ensure that all members of the range team have a comprehensive understanding of their role.

Exhibit 205
Exhibit 207

1.4.62 On 22 Aug 16, the walk through was conducted during the check fire period between 1700-2000 by the RCO, during daylight hours. PAM 21 states "For night training without illumination, safety staff are to walk through and confirm the LNV for all targets immediately prior to each exercise"²⁹. This was not conducted; the walk through was carried out from the side of the range (Figure 33), in daylight hours, with the safety staff remaining on the high ground whilst the brief was delivered. During interview, the RCO stated that he conducted a talk through, not a walk through, which he stated he had been taught as an acceptable means during his SA (A) (90) Range Management Qualification Course. The Panel contacted 3 individuals from the same syndicate on the same

Witness 6

Exhibit 244
Exhibit 245

²⁹ PAM 21 Ch. 7 Sec 3 0771c.



SA (A) (90) Course. All of those contacted were from different regiments to the RCO and they all stated that they had not been taught that a talk through was an acceptable alternative to a walk through. The lack of a thorough walk through, to confirm the LNV with the safety staff, meant the RCO relied on a talk through from the high ground during daylight. The key issues resulting from this were that target triangulation and LNV confirmation were not conducted. The impact of this is that safety supervisors would not have a clear understanding of the positions from which it was safe for firers to engage targets. In the opinion of the Panel, the lack of a walk through in accordance with the requirements of PAM 21 was a **Contributory Factor**.

Exhibit 246

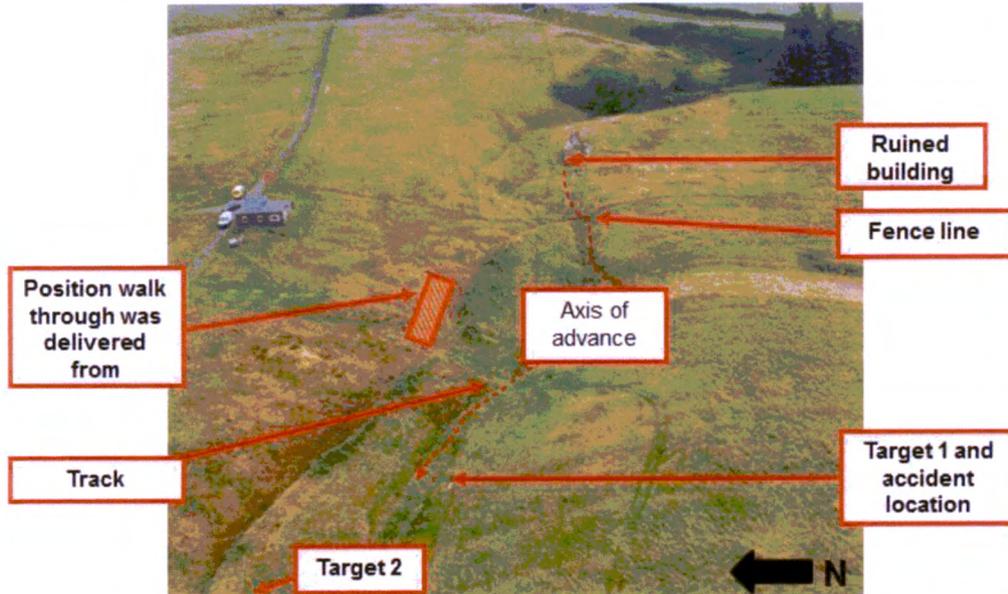


Figure 33: Map of Heely Dod range with position where walk through brief was delivered from.

Range Safety and Construction – Safety Supervisor Refresher Training

1.4.63 PAM 21 states that safety supervisors are to receive refresher training for their role, as required, supervised by the RCO. Prior to the range on 22 Aug 16, SS2 had not been a safety supervisor on a range for over a year and had never been a safety supervisor for a night range without illumination. SS1 last acted as a safety supervisor in Nov 15. In the opinion of the Panel a lack of recent night firing experience meant refresher training for safety supervisors would have been advisable. This would have ensured that the safety supervisors were refreshed in their roles. The lack of safety supervisor refresher training prior to this night exercise was an **Contributory Factor**.

Witness 10
Witness 9

1.4.64 **Recommendation.** HoC Cbt should provide specific direction in PAM 21 under which circumstances safety supervisor refresher training is required and provide a structure for training.

Range Safety and Construction – Range Paperwork for Alternate LF Practices

1.4.65 For the range activity at Heely Dod Range on 22 Aug 16, 2 RASPs were submitted to OTA Range Control for FT attack by day and night. There were 7 additional shoots (Rifle Zero, Auto Shoot, Bayonet Shoot, Close Quarter Battle (CQB), individual Fire & Manoeuvre (F & M), Night Sight Zero and LNV Shoot) conducted at Heely Dod Range on 22 Aug 16, but these were not mentioned in the 2 RASPs submitted or specific RASPs were not produced to cover the activities. It is mandated within PAM 21 that a RASP should be produced to cover all live firing activities.

Exhibit 207

1.4.66 During initial interview, the RCO stated that he did not produce this additional paperwork as he believed that someone else had produced it, but could not define who. OTA Range Control has confirmed that they did not receive this paperwork and no paperwork for these shoots was held on the range. 3 SCOTS have not provided the additional paperwork and it is clear to the Panel that there was confusion as to who was responsible for producing it. There were only RASPs completed for the Day and Night FTA and the other shoots were not referenced on the paperwork. The lack of additional RASPs to cover all LF activities was an **Other Factor**.

Witness 6
Exhibit 243

Range Safety and Construction – Planning Supervision

1.4.67 This FT attack by night was the first time that the RCO had conducted a range since qualifying from his SA(A)(90) course. This was a difficult range to run because it was at night with no illumination. It was also the first time that any of the firers or safety supervisors had taken part in a range without using illumination, which added to the complexity. As a consequence the planning and supervision for this range needed to be thorough. The SPO did spend most of the day with both the PO and RCO, the day before and on the day of the range, to ensure that these officers received guidance.

Witness 6
Witness 9
Witness 10

1.4.68 The SPO had completed the mandatory Defence Learning Environment (DLE) online training for SPO's; however, he did not refer to the SPO checklist from PAM 21³⁰ and was unaware that it was a requirement when interviewed. Despite the SPO checklist not being followed, the SPO was heavily involved with the planning and conduct of the range package with the PO and RCO. He was present for the planning at Heely Dod Range on Sun 21 Aug 16. He spent most of the day and night of the 22nd at the range with the PO and RCO. During interview, the SPO informed the Panel that he did not ensure that the RASP was countersigned. In the Panel's opinion, he could have done more to ensure that the PO and RCO produced RASPs, covering all LFTT activities, in detail to the mandated standard within PAM 21. Following the SPO checklist could have ensured that this occurred.

Witness 1

Witness 1

1.4.69 That said, the Panel noted that when the SPO completed his DLE

³⁰ PAM 21 Ch2 Sec 1 pages 6-7.

online training for the SPO role, the SPO checklist was not included. The SPO Checklist provides the SPO with the relevant guidance and prompts to ensure the range is safely conducted. The checklist had previously been incorporated into PAM 21, but had not been promulgated through the SPO training. The SPO checklist has subsequently been included in the DLE online SPO training. The Interim Report for this accident was widely distributed throughout Defence and included a reminder to all SPO's about the use of the mandated SPO checklist.

Exhibit 253
Exhibit 251

1.4.70 The PO had held the SA(A)(90) qualification since Aug 15 and had experience running LFTT ranges in Nov 15 and Feb 16. He had never been a PO before and his course report, from his SA(A)(90) qualification, stated that he had reached the minimum standard and would need mentoring in the future by the SPO for Range Danger Area (RDA) traces³¹. A RDA trace was not required for this range. It was his responsibility to ensure that rules and regulations within PAM 21 were followed. The Panel believes that the PO, as an experienced RCO, could have provided more guidance to the RCO; however, he too could have also received more mentoring on his role by the SPO. The Panel concludes that the lack of effective planning supervision was an **Other Factor**.

Exhibit 234
Exhibit 207

Range Safety and Construction – Recce

1.4.71 Although the PO and Trg Sgt had been to Heely Dod Range, on separate occasions to recce the range, prior to arrival on Ex WS 16/4, only limited planning took place. Instead, the PO and RCO conducted their recce and planning for the FT attack by day and night on Sun 21 Aug 16, after a short brief from the Trg Sgt. During this planning period, the SPO was in attendance for part of the recce and the CO received a brief from the PO and RCO at Heely Dod Range. During their recce, the PO and RCO planned which targets were going to be used. The lack of a thorough recce prior to the arrival at OTA was an **Observation**.

Witness 29
Witness 1

Witness 20

Range Safety and Construction – Hand Over/Take Over (HO/TO) Procedure

1.4.72 When the PO had completed the day ranges (where he acted as the RCO for the day attacks), the RCO took control for the night range; however, there was no formal HO/TO, even though the SPO had directed that this should happen.

Witness 1

1.4.73 Once day ranges had concluded the PO did not inform Range Control of a change in RCO. The RCO did not countersign the RASP and neither signed the 906A as directed in PAM 21. This meant that according to the Range Log the PO was still running the range that night, not the RCO. The 906A was signed retrospectively on 24 Aug 16. The lack of a formal HO/TO between PO and RCO, despite it being directed by the SPO, was an **Observation**.

Exhibit 53
Exhibit 19
Exhibit 56
Exhibit 46

Range Safety and Construction – Targetry Performance

³¹ A RDA trace is a technical drawing of an amalgamation of Weapon Danger Area (WDA) templates worked to a given scale and produced on appropriate material for convenient application to a map.

1.4.74 Firer 2 stated during interview that a target appeared to his front left, at which he fired 2 rounds from the standing position, before adopting a kneeling position and applying his safety catch. Noting the close proximity of Target 1 and Pte McPherson to Firer 2's front and left (Figure 1), the Panel pursued a line of inquiry to assess whether the target had been accidentally activated by the Target Operator (TO) or if it had malfunctioned.

Witness 11

1.4.75 Target 1 was removed from Heely Dod Range as evidence by the Panel. It was initially examined and tested by a Landmarc Targetry Division contractor who specialises in current military targetry systems. He tested the target along with the Panasonic Toughbook, which was used by the TO. He interrogated the Panasonic Toughbook and confirmed that no After Action Review (AAR)³² had been recorded from the activity on the 22 Aug 16; as a result, he was unable to confirm if the target was up when the accident occurred. During interview, the Panel asked all those present if they had seen Target 1 appear immediately prior to the accident. The only person who believed that the target did appear was Firer 2. The Panel believes it is highly likely that Firer 2 did not see Target 1 appear; instead it was Pte McPherson who was mistaken for a target (paras 1.4.15-22).

Witness 30

1.4.76 The Landmarc contractor suggested that data could possibly be accessed by the manufacturer of the Toughbook and Target 1. When testing the system, he identified that there could be an intermittent time delay of up to 15 seconds between commands being given by the TO on the Toughbook and the target responding. LM, the manufacturer, confirmed that there can be a delay of up to 5 minutes for the target to respond to the Toughbook; this is in line with the design specification.

Exhibit 250

Exhibit 184
Exhibit 185

1.4.77 In Jan 17, the equipment was escorted by members of DAIB to the USA where LM conducted a thorough examination and test on the equipment. Target 1 was also examined, confirming that it was operating within the parameters of its specification. LM could not establish if a target was exposed out of sequence as the AAR function was not enabled and had not been used since 2015. A full report was compiled and provided to the SI by LM, which confirmed that the equipment performed in line with the manufacturer's specification. The Panel believe that it is unlikely that Target 1 appeared out of sequence; however, due to the AAR facility not being enabled, this cannot be completely discounted. The lack of activation of the AAR function was an **Observation**.

Exhibit 185

1.4.78 **Recommendation.** HOC Cbt should provide direction or guidance to users on the use of the SART AAR function in order to allow debrief of routine training events and full interrogation of data in the event of an occurrence.

Range Safety and Construction – Ammunition Deficiency (Illumination)

1.4.79 During the night LF at Heely Dod Range on 22 Aug 16, there was no form of illumination employed on the range. Ammunition indents and witness

Exhibit 219

³² After Action Review (AAR) is a data recording function within the Panasonic Toughbook to enable post exercise review to capture the lessons learned.



testimony confirmed this. The RCO and safety supervisors confirmed that they held no form of light with the exception of personal torches. PAM 21 stipulates that when conducting night firing without illumination white light, a mini or hand held rocket flare, must be carried by the safety supervisors which can be fired to prevent a dangerous practice. The Panel do not believe that the lack of emergency illumination was a factor in Pte McPherson's death as the safety supervisor did not see Pte McPherson enter the line of fire and therefore it would have been impossible to deploy instantly; however, it is an **Other Factor**, as it may contribute to future accidents.

Exhibit 207

Range Safety and Construction – Range Fixed Movement Boxes and Arcs

1.4.80 DIO facilities currently issue fixed movement boxes³³ and arcs on some ranges, although users do not have to use them. The Panel suggests users are reminded that, in order to remain current and competent with the planning process, individual traces should be considered to be best practice. This would encourage fuller planning and deeper understanding when marking bespoke movement boxes, arcs and help facilitate a more detailed walk through. The Panel's opinion is that it was not a factor in the accident, but is a worthy **Observation** when considering promoting better working practices.

Witness 27

1.4.81 **Recommendation.** HoC Cbt should ensure that RCOs are encouraged to conduct the full planning process, even when a fixed movement box is provided, in order to improve training value and safety.

Training Progression - Training Progression at Night in Line with the Operational Shooting Policy (OSP)

1.4.82 3 SCOTS told the Panel that, in accordance with OSP, the firers in the FT involved in the accident had conducted LFTT to section level at night, within the previous 12 months. However, there was a lack of supporting evidence produced to the Panel to confirm the assertion that all firers conducted the full progression from CQB, Individual, and Pairs F & M to FT attack. Additionally, documentary evidence and interviews conducted could not confirm whether the night firing was conducted using white light, IR illumination or in black light with no illumination. However, the OSP does not differentiate between light levels and there is no defined training progression for LFTT at night.

Exhibit 33
Exhibit 212
Exhibit 213

Exhibit 239

1.4.83 It is possible that the rapid progression from FT attack by day to FT attack at night, black with no IR illumination, was too advanced for the soldiers training level; 2 firers in the previous detail commented that they lacked confidence during the range exercise. The lack of documented evidence suggests that neither the firers nor safety supervisors had ever conducted LFTT ranges at night in black light, with no IR illumination. However, the current OSP Volume 1 allows this progression to take place. It also allows firers to fire any LFTT range, at FT and below, at night as long as they have completed the same range by day; however, it does not specify at what level night training should start at (CQB, Individual, Pairs F & M or FT attack) or under what light conditions. The Panel

Witness 19
Witness 17

³³ A movement box is designated area of ground in which LFTT is cleared to take place.



concludes that the rapid rate of night training progression and the lack of experience of night firing, without illumination, was a **Contributory Factor** in the accident.

1.4.84 **Recommendation.** HoC Cbt should review the current training sequence of LFTT at night, in the OSP, in order to ensure that the training progression is appropriate.

Training Progression - Delay in Commencement of Firing and Excessive LF Serials

1.4.85 A Coy chose to march 1 PI to the range and dispatch 3 PI in their FOXHOUND vehicles to a RV 1 mile short of Heely Dod Range. The 2 transiting PIs were both delayed; 1 PI because of miscalculating the time it took to march to the range and 3 PI as they got lost during transit. This resulted in the range commencing 1 ½ hours late, which compressed the time available to conduct the practices required.

1.4.86 During the day of the accident, the range staff conducted 9 separate shoots³⁴ for 2 platoons and attached personnel. The progression of training, at such a fast pace meant that some firers were going from Rifle Zeroing, through 7 other shoots, to FT at Night with no illumination in one day. This meant that 2 of the Day FT attacks had to take place after the 1700-2000 check fire.

1.4.87 If firers conduct 7 separate shoots in a day and progress to FT at night with no illumination the Panel considers that there is insufficient time to review their performance from previous ranges prior to moving onto the next. Range staff need to ensure that firers have an appropriate training progression and feedback to ensure training benefit and safety. To get a company and additional personnel through 9 separate shoots in one day, the ranges had been compressed and training value potentially lost. The emphasis on realism would also have been impacted due to the timing constraints on the range staff. The Panel has found no evidence of any excessive fatigue contributing towards the accident; however, this **Observation** was worthy of consideration in order to decompress the range programme so that both training and safety are enhanced.

1.4.88 **Recommendation.** HoC Cbt should conduct a review to generate planning guidelines for conducting range activity for LFTT, in order to balance through put against training value and safety.

Training Progression - Ex WESSEX STORM LFTT / Tactical Engagement Simulation Exercise (TESEX) order

1.4.89 TES simulates the characteristics, lethality and vulnerability of vehicles, equipment and personnel; it allows the unit to receive accurate and timely weapons effects, situational awareness and data capture during its training on Ex WS. These products enables the unit to assess and measure all areas of

Witness 1

³⁴ Rifle zeroing, automatic shoot, bayonet shoot, individual Close Quarter Battle, pairs Fire & Movement, FT day, Limit of Night Visibility Shoot, Night Vision Goggles zero and FT night.

its performance against its own training objectives. There are only limited opportunities for a unit to receive delivered force on force training supported by TES during the training cycle and experience the value that it offers. TESEX is currently conducted after the LFTT phase of Ex WS. Two of the 9 firers interviewed stated that the range was beyond their current capability and it concerned them. This supports the Panel's opinion that conducting TESEX prior to the LFTT phase of Ex WS could instil firers with greater confidence in their ability to operate at night LFTT.

Exhibit 85

Exhibit 202
Witness 19
Witness 17

1.4.90 Field Training Unit (FTU) gave 3 reasons for the LFTT phase being conducted prior to the TESEX phase of Ex WS:

Exhibit 202

a. If units conducted LFTT after the TESEX phase it would not be a natural training progression; the unit would have to revert to LFTT at the lowest level (individual to company level) having just completed Battlegroup instrumented attacks.

b. After an arduous exercise (which degrades soldiers both mentally and physically) FTU has found that there are significant numbers of soldiers who develop injuries, which would preclude them from then conducting essential LFTT.

c. There is a significant amount of post exercise administration (in terms of Tactical Engagement Simulator (TES) instrumentation) required; moving from TES to LFTT would take more time (and therefore be more expensive in terms of the provision of the TES contract). The current consensus across collective training establishments is that it is better to deliver LFTT first, for the benefit of the exercising audience.

1.4.91 The Panel understands FTU's reasoning for conducting Coy LFTT prior to the BG TESEX phase; however, consideration must be given to balance training benefit against the risk to life. The **Observation** was not directly linked to the accident, but is worthy of consideration to promote a safer training progression between blank and live firing exercises.

1.4.92 **Recommendation.** Field Army Training Branch (Fd Army Trg Branch) should conduct a review into the training benefit versus inherent risks in conducting LFTT prior to TESEX during Ex WS and ownership of risks therein.

Training Progression - FTU Start Standards

1.4.93 There was confusion between 3 SCOTS and FTU regarding who decided that 3 SCOTS should reach PI at night (black without illumination) by the end of Phase 1 on 26 Aug 16. FTU has confirmed that the final exercise Instruction released to 3 SCOTS stated that they should reach PI at Night (Black) and that this was agreed with 3 SCOTs CoC; however, by leaving the term as Black it did not clearly stipulate with or without illumination. FTU state that they did not specify with or without illumination and that this would have been agreed between FTU and 3 SCOTS subsequently. Previous Ex WS exercise Instructions released by FTU have stated PI at Night but there was no mention of what type of illumination was required (White, Black with IR or Black without any illumination).

Exhibit 85
Exhibit 202
Witness 25



The lack of clarity in the start standard between FTU and 3 SCOTS was an **Observation**.

1.4.94 **Recommendation.** Fd Army Trg Branch should make it clear what the night LFTT standards are in the exercise instructions for Ex WS.

Training Progression - Lack of Record Keeping

1.4.95 All range staff involved with the accident were qualified: however, the safety supervisors had not conducted refresher training, which the RCO should have overseen or alternatively a centralised package, run by the Bn Trg Wg, could have been conducted. Training records held by A Coy were incomplete from exercises in Kirkcudbright (Nov 15) and Barry Buddon (Feb 16). This is particularly relevant when ascertaining which soldiers had completed what element of their LFTT progression, in accordance with the OSP, to qualify them in date to fire at each stage. In addition the butt registers and interviews were unclear as to what type of illumination was used during the FT and sect level night attacks.

Witness 5
Witness 2

1.4.96 When interviewed the Coy 2IC and the Spare PI Comd both agreed that there was a lack of efficient record keeping within A Coy. The company 2IC role, within the Infantry, is often used as a transitory appointment and both officers when interviewed said that not enough emphasis is placed on the importance of the position. Both the Coy 2IC and Spare PI Comd had not received training on the role or a thorough HO/TO. Both had accepted this and the state of the company records as the norm. The Coy 2IC later received training on the roles of a Coy 2IC, when he attended the Junior Officer Tactical Awareness Course (JOTAC)³⁵. It is the Panel's view that Junior Officers should not assume the role of a Coy 2IC until they have completed this course. The lack of accurate record keeping was an **Observation**.

Witness 5

Witness 2
Exhibit 261

1.4.97 **Recommendation.** HoC Cbt should conduct a review into the minimum competencies required to assume the role of a company 2IC, reflecting them in the job specification, in order to ensure Junior Officers are appropriately trained and qualified prior to undertaking 2IC duties.

Training Progression - Crowded Forecast of Events (FOE)

1.4.98 For 3 SCOTS, Op VOCATE took up the majority of 2014 and Op TOSCA filled 2015. On return from Op TOSCA, in Oct 15, 3 SCOTS were given orders to convert to the Light Mechanised (Lt Mech) role with a completion date, validated to CT 3, by Oct 16. The tight turn around, from 2 back to back operational tours, compressed 3 SCOTS time to train in a conventional war fighting role; this was further compounded by a conversion from a Light Bn to a Lt Mech Bn in FOXHOUND.

Exhibit 61

Exhibit 62
Exhibit 80

1.4.99 Whilst organisational pressure was not a direct factor in the accident,

Exhibit 143

³⁵ JOTAC is mandatory for all British Army officers and is delivered by the Land Warfare Centre, Warminster. The aim of JOTAC is to prepare Officers for the rank of Captain by raising their awareness of combined arms tactics and by developing their combat staff skills.

it is likely to have created pressure by compressing activities such as LFTT. The rapid tempo of A Coy's training programme, combined with the hectic 3 SCOTS FOE, was an **Observation** as it placed additional strain on all those in positions of responsibility. It is likely that the LFTT planning process was adversely affected as a result.

Range Safety Communications/Medical Plan

Range Communications

1.4.100 All ranges have different requirements which are dictated by PAM 21 and the specific Range Standing Orders. Most major LFTT ranges have a primary and secondary means of communication to Range Control³⁶. During the accident, land line and mobile communications were used in the first instance to report to range control and the civilian medical services. Not using the all informed Airwave³⁷ net resulted in a 28 min delay in the BFA being tasked to the accident as 3 SCOTS HQ and other ranges were unaware of the accident. Airwave or VHF radios operate on all-informed nets and should be considered as the primary means of communication with the land line used as a secondary back up.

Exhibit 20

1.4.101 The use of landline instead of Airwave was not a factor in the death of Pte McPherson, as he suffered an un-survivable injury; however, with a less catastrophic injury it could have been significant. The delay in the BFA arriving also placed significant stress on the soldiers involved who were treating the casualty. The other 2 ranges active that night had already stopped firing for the day, thus the BFA could have been moved to cover Heely Dod Range exclusively. The Panel concluded that the choice of communication means used to promulgate the details of the accident was an **Other Factor**.

Exhibit 247

1.4.102 **Recommendation.** DIO Service Delivery (SD) Trg should review the communications plan, at all range complexes, in order to allow the Range Control Operative to more effectively coordinate an occurrence.

Air Ambulance Availability

1.4.103 3 SCOTS and OTA were not aware that the air ambulance did not operate at night within Northumberland, Durham and Cumbria. The SPO relayed the severity of the accident to range control as well as the emergency services requesting air ambulance assistance. This was declined by the emergency services and it later became apparent that the air ambulance did not operate at night.

Witness 28

1.4.104 Due to the geographical location of OTA, the nearest major trauma unit is situated in Newcastle, which is 35 miles from Otterburn Camp. If the circumstances had been different and the initial shot was not fatal, without air

³⁶ All informed communications system and land line telephone to range control and other ranges.

³⁷ Airwave radios operate on the Airwave network which is a mobile communications network used by the emergency services throughout the UK.



ambulance availability at night, there would be a significant time delay between an accident occurring and an ambulance getting the injured person to a major trauma unit. A best case scenario for this eventuality would be in excess of 1 hour; this could be significant if the accident was life threatening and required immediate specialist care. Air ambulance availability was an **Other Factor**.

1.4.105 **Recommendation.** DIO SD Trg should provide site specific medical evacuation timelines, both day and night, for medical assets available in order to allow the acceptable level of risk to be assessed by the user.

Check Fire³⁸ Post-accident

1.4.106 When the accident occurred, the Electronic Target Range (ETR)³⁹ was running until 2320. The RCO on the ETR has confirmed that although he did not sign off the range until 2320, the last round fired was prior to the accident occurring. Although all ranges had completed firing when the accident occurred, there was nothing within OTA standing orders dictating that the Range Control Operative had to check fire all ranges when a serious incident occurred. At the time Pte McPherson was shot, there was no confirmation where the round had come from. There was a remote possibility that it could have come from another range on OTA; without a complete check fire across all ranges, there is a possibility that there could have been a repeat occurrence.

Exhibit 247

Exhibit 4

1.4.107 If the all informed net had been used at Heely Dod range on 22 Aug 16, then all of the RCO's within OTA would have been aware of the accident and could have stopped firing immediately. If this use of Airwave was not successful, the Range Control Operative could use either the VHF Radio or the land line to inform all range users; however, this is not currently mandated as an immediate action following a major occurrence. The Panel concludes that the lack of a requirement to check fire on all ranges when a serious incident occurs was an **Other Factor**.

1.4.108 **Recommendation.** DIO SD Trg should review their standing orders to ensure that check firing can easily be imposed across all relevant ranges within a range complex following a major incident in order to ensure no further occurrences take place and facilitate unfettered emergency services access.

Unit Medical Plan

1.4.109 3 SCOTS and OTA medical plans did not complement each other, causing confusion about what assets were available and who was responsible for coordinating them. The Unit Medical Plan was not clearly briefed and therefore not understood by all exercise participants. The considerable delay between the accident occurring and the BFA deploying was due to confusion as to whose responsibility it was to inform 3 SCOTS HQ and the BFA. This confusion did not contribute directly to the fatality; however, it heightened the stress levels of the

Witness 6
Witness 10

³⁸ Check fire is a military term which is an order to stop shooting.

³⁹ A static firing range that utilises targets that operate electronically via wire connection in the ground.

soldiers treating the casualty and in a future incident could be critical.

1.4.110 The Medical Plan was produced by the Trg Offr in conjunction with the Med Sgt due to the gap in post between the outgoing and incoming RMO. On arrival in post, the RMO was briefly questioned on the medical plan and this was signed off by the Bn 2IC. The Medical Plan was accurate; however, it was not in line with the Communications Information Plan (CIP)⁴⁰. The poorly defined communications strategy within the medical plan contributed to a significant delay in securing medical assistance for the casualty. Although medical assistance would not have influenced the survival of the casualty in this case; the delay affected those treating the casualty as they had to perform prolonged CPR. With a less catastrophic injury the impact of the delay could have been more significant.

Witness 22

Witness 21

1.4.111 Although the medical plan was briefed to all in attendance, prior to live ranges commencing on 22 Aug 16, the plan was misunderstood. Personnel were informed that it was the responsibility of the Range Control Operative to inform Bn HQ if there was a major occurrence on the range. This is contrary to Range Standing Orders, which stated that it was the responsibility of the unit to inform their CoC and coordinate initial medical assistance with the BFA and Combat Medical Technician (CMT). Range Control was responsible for requesting the assistance of the civilian emergency services. The Panel concludes that the incorrect briefing of the Unit Medical Plan was an **Other Factor**.

Witness 22

Medical Rehearsal/Recce

1.4.112 3 SCOTS were supposed to be reinforced with 3 x CMT medics, from 102 Logistics Brigade, in order to allow 3 SCOTS medics to conduct competency training. The 3 x CMT did not arrive as planned on 21 Aug 16. As a result the 3 SCOTS integral CMTs had to provide medical cover for the ranges once LFTT commenced. The Trg Offr drove all BFA drivers around the ranges to be used in order to familiarise them with their location and layout prior to the start of the LFTT package. There was no medical rehearsal by the Bn as a whole. Had a full rehearsal of the medical plan been conducted this might have enhanced the reaction times of medical assets. The Panel concludes that the lack of a full medical rehearsal was an **Other Factor**.

Exhibit 187

1.4.113 **Recommendation.** HOC Cbt should review PAM 21 to emphasise the need to rehearse the medical plan when conducting LFTT.

Lack of Medical Equipment

1.4.114 Without a RMO for over 4 months, the Med Sgt took responsibility for the running of 3 SCOTS Med Centre and the administration associated with it. The Panel has been provided with evidence that the Med Sgt requested equipment and medicines for Ex WS 16/4 but he was not provided with them. This led to no form of morphine being held in the BFA. If a non-lethal

Witness 23

⁴⁰ The CIP dictates how the communication systems will be used during the exercise, including which system should be used as the main means to speak to specific locations.

incident/accident had occurred, there would have been no strong pain relief available for the casualty. The Panel concludes that the lack of available medical equipment was an **Other Factor**.

1.4.115 **Recommendation.** Headquarters of Surgeon General should define and communicate the minimum level of medical equipment to be held at the range and in the Regimental Aide Post during LFTT.

FT Communications

1.4.116 PRR is a tactical communications device, which can be used to communicate with those in close proximity. The Panel **observed** that although PRR were issued to the range participants and carried, they were not switched on or on the correct channel to communicate. If PRR are issued they should be used to enhance situational awareness and allow the firers to train as they fight.

Exhibit 1

Weapon/Equipment Issues

1.4.117 The weapons and LUCIE NVG involved during the accident are being held by Northumbria Police and have not been released to the Panel. Due to unavailability of this equipment, there has not been an opportunity for an independent armourer to test for serviceability. The Panel has not had access to the Ballistics Report compiled for Northumbria Police and has not therefore been able to confirm which weapon fired the fatal shot. The Panel also cannot confirm at this stage if weapon/equipment unserviceability contributed towards the accident.

1.4.118 **Summary of findings.** The Panel highlighted a number of different factors from the SI. They are as follows:

1.4.119 **Causal Factor.**

- a. The Panel believe that it is highly likely that Firer 2 misidentified Pte McPherson for a target and fired the fatal round.

1.4.120 **Contributory Factors.**

- a. The Panel believes that the use of LUCIE NVG in the DCC LFTT role was a Contributory Factor in the accident as it would have given Pte McPherson tunnel vision when he identified Target 2.
- b. The Panel concludes that providing effective range safety supervision of firing, whilst wearing HMNVS, is considerably more difficult at night and is a Contributory Factor in the accident.
- c. The Panel concludes that the lack of effective supervision of Firer 2 was a Contributory Factor in the accident.
- d. The Panel believes the use of Peltor Ear Muffs to have been a Contributory Factor in the accident as it limited the situational awareness of Pte McPherson.

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e. The Panel considers that the fact that Pte McPherson was not issued with THPS BU was a Contributory Factor in the accident as it resulted in him using Peltor Ear Muffs instead.

f. In the opinion of the Panel, the lack of a walk through in accordance with the requirements of PAM 21 was a Contributory Factor.

g. The Panel concludes that the lack of safety supervisor refresher training prior to this exercise was a Contributory Factor due to the inexperience of safety supervisors during night LFTT.

h. The Panel concludes that the lack of experience of night firing, without illumination, was a Contributory Factor in the accident.

1.4.121 **Other Factors.**

a. The Panel concludes that the lack of thermal targets, in conjunction with the use of VIPR TI, was an Other Factor which could contribute to future accidents.

b. The lack of LLM training was an Other Factor which could contribute to future accidents.

c. The Panel concludes that the confusion on how to use the THPS BU correctly was an Other Factor which could contribute to future accidents.

d. The Panel concludes that the lack of detailed planning, demonstrated by the RASP produced, was an Other Factor which could contribute to future accidents.

e. The Panel concludes that the lack of additional RASPs to cover all LF activities was an Other Factor which could contribute to future accidents.

f. The Panel concludes that the lack of effective LFTT supervision was an Other Factor which could contribute to future accidents.

g. The lack of emergency illumination was an Other Factor, as it may contribute to or aggravate future accidents.

h. The Panel concluded that the choice of communication means used to promulgate the details of the accident was an Other Factor which could aggravate future accidents.

i. The Panel believes that air ambulance availability was an Other Factor which could aggravate future accidents.

j. The Panel concludes that the lack of a requirement to check fire on all ranges when a serious incident occurs was an Other Factor which could aggravate future accidents.



k. The Panel concludes that the incorrect briefing of the Unit Medical Plan was an Other Factor which could aggravate future accidents.

l. The Panel concludes that the lack of a full medical rehearsal was an Other Factor which could aggravate future accidents.

m. The Panel concludes that the lack of available medical equipment was an Other Factor which could aggravate future accidents.

1.4.122 **Observations.** The Panel observed:

a. The emitted light from the target mechanism could cause confusion to firers advancing down a range.

b. The lack of a thorough recce prior to the arrival at OTA.

c. The lack of a formal HO/TO between PO and RCO, despite it being directed by the SPO.

d. The lack of activation of the AAR on the SARTS function.

e. The use of range fixed movement boxes and arcs was worthy of consideration for promoting better working practices.

f. The sequencing of BG level TESEX before company level LFTT would be a safer training progression.

g. The lack of clarity in the start standard between FTU and 3 SCOTS.

h. The lack of accurate record keeping by the Coy.

i. The rapid tempo of A Coy's training programme, combined with the hectic 3 SCOTS FOE placed additional strain on all those in positions of responsibility.

j. That not using PRR during LFTT failed to make best use of equipment for situational awareness.



PART 1.5 – RECOMMENDATIONS

Recommendations	Analysis Reference
1.5.1. Introduction. The following recommendations are made:	
1.5.2. Head of Capability Combat (HoC Cbt):	
a. HoC Cbt should take action to improve personnel identification, when conducting LFTT at night without illumination, in order to reduce the risk of personnel being mistaken for targets.	1.4.14 – 1.4.25
b. HoC Cbt should ensure that policy is introduced to match targets, NVDs and target marking devices in order to facilitate clear target identification.	1.4.26 - 1.4.29
c. HoC Cbt should amend Volume VI ISTAR - Sect & PI Surveillance Target Acquisition Equipment and PAM 21 to accurately reflect the SECR direction for all in-service NVD, in order to inform the user of their limitations during DCC.	1.4.33 - 1.4.36
d. Recognising that safety supervisors' vision and field of view are limited whilst wearing HMNVS, HoC Cbt should develop procedures that enable safety supervisors to effectively fulfil their duties during night LFTT.	1.4.40 - 1.4.46
e. Recognising the noise attenuating properties of the Peltor Ear Muff, HOC Cbt should determine and direct which hearing protection systems are safe and suitable for use during DCC LFTT.	1.4.47 - 1.4.50
f. HoC Cbt should take action to ensure that appropriate training on THPS BU is delivered to all soldiers issued with the system in order to ensure all soldiers are familiar with their effective use.	1.4.54 - 1.4.56
g. HoC Cbt should provide specific direction in PAM 21 under which circumstances safety supervisor refresher training is required and provide a structure for training.	1.4.63 - 1.4.64
h. HOC Cbt should provide direction or guidance to users on the use of the SART AAR function in order to allow debrief of routine training events and full interrogation of data in the event of an occurrence.	1.4.74 - 1.4.78
i. HoC Cbt should ensure that RCOs are mandated to conduct the full planning process, even when a fixed movement box is provided, in order to improve training value and safety.	1.4.81 – 1.4.82
j. HoC Cbt should review the current training sequence of LFTT at night, in the OSP, in order to ensure that the training progression is appropriate.	1.4.83 – 1.4.85
k. HoC Cbt should conduct a review to generate planning guidelines for conducting range activity for LFTT, in order to	1.4.86 –

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	balance through put against training value and safety.	1.4.89
	l. HoC Cbt should conduct a review into the minimum competencies required to assume the role of a company 2IC, reflecting them in the job specification, in order to ensure Junior Officers are appropriately trained and qualified prior to undertaking 2IC duties.	1.4.96 – 1.4.98
	m. HOC Cbt should review PAM 21 to emphasise the need to rehearse the medical plan when conducting LFTT.	1.4.113 – 1.4.114
1.5.3.	Field Army Training Branch (Fd Army Trg Branch):	
	a. Fd Army Trg Branch should conduct a review into the training benefit versus inherent risks in conducting LFTT prior to TESEX during Ex WS and ownership of risks therein.	1.4.90 - 1.4.93
	b. Fd Army Trg Branch should make it clear what the night LFTT standards are in the exercise instructions for Ex WS.	1.4.94 – 1.4.95
1.5.4	DIO Service Delivery (SD):	
	a. DIO Service Delivery (SD) Trg should review the communications plan, at all range complexes, in order to allow the Range Control Operative to more effectively coordinate an occurrence.	1.4.101 - 1.4.103
	b. DIO SD Trg should provide site specific medical evacuation timelines, both day and night, for medical assets available in order to allow the acceptable level of risk to be assessed by the user.	1.4.104 – 1.4.106
	c. DIO SD Trg should review their standing orders to ensure that check firing can easily be imposed across all relevant ranges within a range complex, following a major incident, in order to ensure no further occurrences take place and facilitate unfettered emergency services access.	1.4.107 – 1.4.109
1.5.5	Headquarters of Surgeon General:	
	a. Headquarters of Surgeon General should define and communicate the minimum level of medical equipment to be held at the range and in the Regimental Aide Post during LFTT.	1.4.115 – 1.4.116

1.6 - CONVENING AUTHORITY COMMENTS

3 SCOTS RANGE ACCIDENT – OTA 22 AUG 16

Private Conor McPherson a member of 3 Platoon, A Company, 3 SCOTS was killed during what should have been a fairly routine live-firing night exercise. The Fire Team (FT) level training he was conducting was early in an Infantry unit's training progression and at the lower end of complexity. This perhaps makes his death even more tragic, but equally serves as a reminder of the unique dangers inherent in conducting realistic military training.

As the Convening Authority for this Service Inquiry (SI), I am grateful to the SI President and Panel for their Report. In meeting the Terms of Reference I set them, the Panel has been thorough in logically determining what caused Pte McPherson's death. I agree with the Panel's findings and endorse the Recommendations they make. This is an important Report, applicable to Service units operating in the Land Domain, as it describes how a low-level infantry training event ended with the catastrophic loss of a life.

Understanding the wider context regarding the volatility of 3 SCOTS's forecast of events and the demands placed on them is important. I suspect the Battalion was not alone in their experience, as the Army along with the majority of Defence, undergoes transition and modernisation to meet the Contingent requirements of SDSR 15. Change is necessary, but this accident serves as a reminder of the importance of managing Safety through change and understanding the consequences of change and its potential manifestation at the lowest levels. CO 3 SCOTS deemed deployments on Operations VOCATE and TOSCA had allowed his unit's conventional soldiering skills to decline. This combined with the unit's conversion to the Light Mechanised role and a late order to support Exercise WESSEX STORM, resulted in the Battalion's programme being compressed, with arguably a less than ideal focus on developing the skills that would be needed during the night of 22 Aug 16. This compression continued right up to the Battalion's deployment to Otterburn Training Area (OTA), with detailed range planning for A Company delegated to the Training Sergeant, as the Planning Officer was too busy elsewhere. The rejection of the subsequent Range Action and Safety Plans (RASP) in July for failing 'gross-error' checks might have provided early warning signs.

The programmed activity for A Company on 22 Aug 16 was ambitious. An 18-hour (+) day comprising 9 different shoots, on their first day of firing and having just returned from summer leave. The Panel did not identify fatigue as a factor, but I question why such a long and busy day was necessary. Moreover, such a tight schedule would not allow much time for the soldiers to consolidate and review their performance. The way the Platoons deployed to the ranges from the camp, although perhaps laudable in terms of squeezing in additional training, only served to add unnecessary compression. It wasn't surprising that 2 serials could not be completed as planned before the mandatory check-fire at 1700hrs and would be added to the programme after 2000hrs when the range re-opened for live firing.

Being able to fight successfully at night is a fundamental Field Army skill. To do so soldiers need to be highly competent in their tactical skills and use of equipment – at night technology offers an essential advantage. Although 3 SCOTS were in the early stages of their training progression, understanding individual and team confidence and competence

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in their use of technology to enhance battle-drills, is a basic requirement. This understanding is essential to informing any Risk calculus and in this case, range design for complexity and tempo. It also prepares safety staff, who with experience, can more easily judge the levels of control they might need to impose and identify individuals who might need greater supervision.

The night Fire Team Attack (FTA) range was simple in its design. It used a re-entrant, which would have assisted with orientation at night. The ground would have been familiar to 3 Platoon as they had used it during their training earlier that day. Although 3 Platoon had conducted night FTAs previously, this was to be the first time they had done FTAs at night without illumination. It could not be established whether any of the Safety Supervisors (SS) or the RCO had experience of this practice under these conditions.

The Platoon's preparation was in line with the Operational Shooting Policy, but the transition through the day to FTA at night without illumination, was probably too rapid as it unsettled some members of the Platoon. Despite these 'firsts', it was surprising a full 'walk-through' of the range with the SS was not conducted. This is mandated, as it allows all Safety Staff to orientate themselves with the ground, with safety arcs and with those parts of the practice that contained higher Safety Risk. I would have expected range-qualified staff to have questioned this omission and insisted on a full 'walk-through'.

The night FTA range started at 2200hrs. Pte McPherson's FT were to be the second FT on the range. The first FTA completed without incident, although some soldiers struggled with their lack of experience of firing at night, as confirmed to the Panel in interview. They found light levels without artificial illumination particularly challenging. Some kept falling over and could not clearly identify the targets. The Senior Planning Officer (SPO) debriefed the first FT, yet none of the soldiers raised any of these concerns at that time. The Panel could not establish why concerns were not raised. Perhaps the soldiers lacked the confidence to do so, perhaps they didn't want to appear to challenge their Chain of Command or perhaps they did not realise the importance of doing so to the safe conduct of the range their colleagues were about to do? Regardless, there was little opportunity to provide feedback to the second FT, as being short of time, they had already departed the Holding Area.

The Panel concluded it was highly likely Pte McPherson was killed by Firer 2 who mistook him for a Figure 11 type target and engaged as he was trained to do. Pte McPherson was estimated to be only some 5 metres from Firer 2 when the fatal shot was fired. Understanding why this misidentification could happen and why the safe conduct of the range failed to prevent it, formed an essential part of the Panel's investigation and subsequent recommendations.

The Panel's reconstruction of the accident was careful in ensuring it was conducted under similar illumination levels to 22 Aug 16 and used identical equipment. It showed starkly the difficulties the FT must have faced in distinguishing between a soldier and a Figure 11 target. Without artificial illumination, the method used for marking other FT members and SS with Infra Red (IR) Cyalumes did not offer sufficient distinction (and have since been modified). This confusion would have been compounded by the variety of night vision devices and other equipment used by the FT on 22 Aug 16. I suspect the resultant cumulative Safety Risk was neither recognised nor the potential consequences understood by the FT, supervisory staff or Battalion leadership.

The LUCIE Universal Night Vision Goggle used by Pte McPherson was not cleared for use for this type of live firing activity, mainly owing to its impaired peripheral vision and lack of depth perception. The VIPR thermal imaging sight used by Firer 3 relies on thermal contrast, for which the targets and range had not been set up for. It also should not have been used for this range. The Night Vision device cleared for use for this type of training was the Helmet Mounted Night Vision System (HMNVS). Firer 2 wore HMNVS, yet he still failed to identify the correct target, owing to the current practice of marking fires and indicating targets.

The reconstruction demonstrated how the procedures for distinguishing personnel from targets were not robust enough. It also showed how the Laser Light Marker (LLM) Mk 3's laser spot added confusion by being difficult to distinguish from the IR light emitted from a Cyalume. This latter point might not have been evident to the FT, as A Company were only issued with the new Mk3 LLM on arrival at Otterburn. There was no recorded evidence that the soldiers had received the training package that came with it.

Equipment unfamiliarity and variety extended to the hearing protection being worn. Pte McPherson was wearing Peltor Ear Muffs, which offer 'dumb' protection in that they attenuate noise over a broad frequency range. Although the use of Peltor Ear Muffs was not prohibited, their use would have reduced a user's situational awareness. The remainder of the FT were wearing Tactical Hearing Protection System Basic User (THPS BU). These are issued to all combat units, offer similar levels of protection to Peltor, but have a switch to allow better levels of hearing. However, owing to not having seen the training videos or read the accompanying literature, the majority of soldiers interviewed by the Panel, did not know how they worked.

The primary responsibility of SS is to ensure the safe conduct of a range. Any shortcuts in the planning, preparation and rehearsal of a range will limit the level of understanding of where and when greater Safety Risk might arise and how best to respond to mitigate. Knowing the training levels and competence of the soldiers being trained and having good practical knowledge of the equipment being used is also essential to mitigating Safety Risk. Experience, especially of similar training events in similar conditions, also helps, as does currency in doing so.

The Panel found SS1 (supervising Pte McPherson and Firers 2 and 3), had not supervised a range since Nov 15 and SS2 had not done so for over a year. Neither had supervised a night FTA range without artificial illumination. SS refresher training is recommended and this should have been a priority for SS1 and SS2, yet this was not carried out.

The Panel's reconstruction identified how the HMNVS worn by SS1 made his duties considerably more challenging. The HMNVS is worn over the left eye. It creates an effective blind region to the left of centre, covering over a third (80 degrees) of the normal uncovered eyes' field of view (200 degrees). Furthermore, the HMNVS only offers 40 degrees of vision. This compares to the 33 degree Safety Angle (590 mils), which is applied by SS on a firer. If a person enters this Safety Angle the SS is to stop the firer from engaging. HMNVS therefore only offers a 'buffer-zone' of 7 degrees, which at short ranges, allows almost no time for the SS to respond to a person crossing a firer from the left. It is essential for all users of HMNVS to be aware of this limitation and to position themselves accordingly to mitigate additional Safety Risk. A warning to users of HMNVS

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is provided in the Equipment Safety Case and in Pam 21, but no evidence has been provided of detailed analysis indicating the level of Safety Risk this constraint imposes and how the warnings given mitigate resultant Risk to Tolerable and ALARP.

The Panel's analysis of post-incident activity raises important lessons, including the necessity to plan in accordance with procedures, to rehearse and to ensure common understanding of emergency drills. This includes knowing what civilian emergency services would be available and how quickly they would respond. It was surprising that neither Otterburn Training Area permanent staff nor 3 SCOTS knew the civilian air ambulance did not operate at night within Northumberland, Durham and Cumbria. Owing to the nature of Pte McPherson's injuries, none of the post-incident shortfalls identified would have prevented his death.

I mentioned at the start of my assessment the importance of this Report and its wide applicability. I hope this is now obvious. In summary, I would like to highlight themes for consideration:

- The first concerns the levels of Safety Risk that are acceptable during this and subsequent stages of (Infantry) training. It is unclear how, in the case for 3 SCOTS, this was articulated and how the unit ensured cumulative Safety Risk was understood, managed and mitigated to fall within given acceptable limits. Military training by necessity needs to be realistic if it is to train soldiers to succeed in combat. This not only reinforces the importance of understanding Safety Risk, but also how the appetite to take increasing levels of Safety Risk should reflect where the unit is in its training progression and what it is training for in terms of Readiness. Clearly, once a unit has been warned for operational deployment, it would be appropriate for Mission Specific Training or Pre-Deployment Training to be designed to accept greater Safety Risk. What would not be appropriate is for excessive levels of unnecessary Safety Risk to be taken during early stages of training. Safety Risk owners determine appropriate levels, with their roles defined within TLB (and for this specific case, the Army's) Safety and Environmental Management Systems. Well developed processes for understanding and managing Risk builds confidence, improves effectiveness and reduces Risk aversion.
- The second concerns the importance of a Positive Safety Culture. This is not a 'specialist dark art', but at its most basic level, it is feeling responsible and having the confidence at all levels to raise concerns, to report hazards and near misses and to learn, within a climate that encourages and promotes such behaviour.
- The third is the vital role of Leadership in Safety. This needs definition and incorporation in the training of all leaders. Leaders set the tone, provide the example, mentor and supervise, set the standards, give the orders and carry the responsibility. They must know what good and bad look like and what is acceptable. They must know their soldiers, their equipment and the consequences of not following procedures. Strong Leadership will drive a positive Safety Culture within an organisation by demonstrating leadership commitment to effective safety management.

I am sure addressing the Recommendations made by the Panel will reduce the likelihood of a similar accident reoccurring. Indeed, they will contribute to ensuring units are better

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'set up for success' for the conduct of their training. Military training must continue to test and challenge, with progression through a unit's training cycle correctly adding complexity and greater levels of Safety Risk. To not do so would reduce the value of training and the preparedness of our soldiers to fight and win in future conflicts. In doing this, junior leaders must continue to be given responsibility, with levels of supervision carefully set to enhance their learning and develop their ability.

The tragic death of Pte Conor McPherson serves as a reminder of the dangers inherent in Military training. On behalf of the DSA, I offer condolences to his family, loved ones and friends.

Lieutenant General Richard Felton

Director General DSA