

# UK MOD Aircrew Clothing and Issued Equipment - Initial Findings of an Aircrew Survey

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16<sup>th</sup> SAFE Europe Symposium  
Date: 1 April 2009

## AIRCREW CLOTHING AND ISSUED EQUIPMENT PERCEPTION QUESTIONNAIRE – ROTARY WING

Survey identification number:

### About this questionnaire

The Directorate Equipment Capability Theatre Airspace (DEC TA) Aircrew Protection and Survival (APS) is investigating the suitability and effectiveness of current issued aircrew clothing and equipment. The purpose of collecting this information is to inform the design and procurement of future aircrew clothing and equipment. QinetiQ is carrying out this survey on behalf of DEC TA APS.

This questionnaire is collecting information from rotary wing aircrew on:

Usage and acceptability of issued aircrew clothing and equipment that you have used over the last 12 months.

Items of non-issued and issued ground clothing and equipment you have used during your flying duties over the last 12 months.

We are interested in your opinions on current equipment, and whether you have supplemented issued items. The questionnaire is your opportunity to highlight any issues, both good and bad, that you have with clothing and equipment. The information will be used to influence the design and procurement of future equipment and clothing.

Your opinions will be held in **strictest confidence** and are **completely anonymous**, and so please answer the questions as openly and honestly as possible.

### How to complete the questionnaire

1. You will need your **Log Book** to answer some of the questions.
2. Most of the questions relate to your **last 12 months of duty**, and so please answer the questions only in relation to this period of time.
3. The questionnaire will take about 1 - 2 hrs to complete.
4. Equipment images are provided for example only. Not all variants of Aircrew Equipment Assembly items are illustrated.
5. When you have completed the questionnaire, please return it to your point of contact sealed in the envelope provided.

**Thank you for your co-operation in completing this questionnaire.**

## Background

- The performance of protective clothing is vital in ensuring that aircrew are provided with the protection against the potential hazards faced during normal flight and in an emergency
- There is a need to balance the level of protection the equipment provides against the impact on aircrew performance, but there is poor understanding of the degree to which current issued equipment affects aircrew comfort and aircrew's ability to undertake their role
- Therefore, it has been identified that there is a need to collect information on aircrew perception of their clothing and man mounted equipment
- In addition, some aircrew are supplementing issued equipment with non-issued items, and there is a need to understand the aircrew perceived requirement for additional equipment

This work is being conducted as part of the MOD Aircrew Protection and Survival (APS) research programme.

## Aim

- A clothing and equipment questionnaire has been developed in order to:
  - Provide an understanding of the user's perception associated with current aircrew clothing and issued equipment (AEA)
  - Provide an understanding of the usage of standard issue and non-standard issue equipment and clothing during flying duties

# Questionnaire Development

- An anonymous Rotary Wing (RW) and Multi Engine (ME) aircrew questionnaire has been developed with stakeholder input:
  - DEC TA, Dstl, AE&S IPT, aircrew (Boscombe)
- Questionnaire was trialled by a small group of aircrew at RAF Odiham
- Questionnaire asked aircrew to provide answers relating to equipment and clothing they had used for flying duties over the last 12 months.
  - This timescale bounded the responses to ensure they were relevant to current equipment.
- Estimated 1-2 hrs to complete

# Questionnaire Structure

- The questionnaire is divided into five parts:
  - **Part 1** asks for details of background and experience.
  - **Part 2** asks for details of recent training and deployments.
  - **Part 3** asks for details of each item of clothing used in the last 12 months and their opinions on it:
  - **Part 4** asks for information on non-issued survival aids they might carry.
  - **Part 5** asks for general views on issued aircrew and ground clothing, and on any non-issued items of clothing and equipment they have used during flying duties.

## AEA Items Addressed

- **Helmet Equipment Assembly**
  - Aircrew Helmet
  - Headsets
  - Night Vision Devices (NVDs)
  - Face Protection Visor (FPV)
  - Oxygen Mask
  - Secondary Hearing Protection
  - Visual Enhancement Equipment (VEE)
  - Torches
- **Operational and Non-Operational Variants**
  - Coverall
  - Longjohns
  - Vest
  - Aircrew Socks
  - Boots
  - Life Preserver
  - Survival Waistcoat

# AEA Items Addressed

## Environment Specific Clothing & Equipment

- Aircrew FRCS 95 - shirt & trousers
- Aircrew FRCS 95 - jacket
- Temperate Combat aircrew suit – jacket & trousers
- Temperate Combat aircrew suit - waistcoat
- Temperate Combat aircrew suit - rainproof jacket & trousers
- Cold Weather Flying Suit
- Immersion Coverall
- Knitted Inner Coverall
- Liquid Conditioning Vest
- Jersey (aircrew knitted)
- Aircrew Roll Neck
- Aircrew Gloves
- Protective Body Armour
- Parachute Assemblies

# Usage

<p><b>Q3.1.0</b> Have you worn a helmet in the last 12 months?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No.                  If <b>Yes</b>, please complete this section.                  If <b>No</b>, why not?                  If <b>No</b>, move on to Section 2.</p>	
<p><b>Q3.1.1</b> How many aircrew helmets do you currently hold?</p>		
<p><b>Q3.1.2</b> Which types of aircrew helmet are you currently issued with?</p>	<p><input type="checkbox"/> Mk 4A/4  <input type="checkbox"/> Mk 4B/4L  <input type="checkbox"/> Mk 10B  <input type="checkbox"/> Mk 10C</p>	<p><input type="checkbox"/> Apache IHADSS  <input type="checkbox"/> Mk 10R  <input type="checkbox"/> other; please specify:                  _____                  -</p>
<p><b>Q3.1.3</b> Of these, which aircrew helmet do you use routinely?</p>		



# Average Length of Wear

<p><b>Q3.1.7</b> What is the average length of time you wear your aircrew helmet for during a 24 hour period? (Add up and include all sorties and any ground periods within a 24 hour period)</p>	<p><input type="checkbox"/> &lt; 2 hours  <input type="checkbox"/> 2 to &lt; 4 hours  <input type="checkbox"/> 4 to &lt; 6 hours  <input type="checkbox"/> 6 to &lt; 8 hours</p>	<p><input type="checkbox"/> 8 to &lt;10 hours  <input type="checkbox"/> &gt; 10 hours; please specify:          _____          _____</p>
<p><b>Q3.1.8</b> What is the longest continuous time you wear your aircrew helmet? (Longest single sortie, including ground periods if you do not remove your helmet)</p>	<p><input type="checkbox"/> &lt; 2 hours  <input type="checkbox"/> 2 to &lt; 4 hours  <input type="checkbox"/> 4 to &lt; 6 hours  <input type="checkbox"/> 6 to 8 hours</p>	<p><input type="checkbox"/> 8-10 hours  <input type="checkbox"/> &gt; 10 hours; please specify:          _____          _____</p>
<p><b>Q3.1.9</b> What is the average continuous time period you wear your aircrew helmet? (Average single sortie including ground periods)</p>	<p><input type="checkbox"/> &lt; 2 hours  <input type="checkbox"/> 2 to &lt; 4 hours  <input type="checkbox"/> 4 to &lt; 6 hours  <input type="checkbox"/> 6 to 8 hours</p>	<p><input type="checkbox"/> 8-10 hours  <input type="checkbox"/> &gt; 10 hours; please specify:          _____          _____</p>

# Comfort

<p><b>Q3.1.10</b> In general, how acceptable do you consider your aircrew helmet to be in terms of <b>comfort</b> (where 1 is unacceptable and 5 is fully acceptable)? Please comment on your rating:</p>	<p style="text-align: center;">1      2      3      4      5</p>
<p><b>Q3.1.11</b> If you consider your aircrew helmet is less than comfortable when worn as part of your aircrew equipment assembly please indicate how the discomfort manifests itself. If you consider your helmet comfortable please go to <b>Q3.1.17</b></p>	
<p><input type="checkbox"/> excessively hot</p> <p><input type="checkbox"/> excessively cold</p> <p><input type="checkbox"/> pressure points. If so, where? <input type="checkbox"/> forehead <input type="checkbox"/> top of head <input type="checkbox"/> back of head <input type="checkbox"/> at ears <input type="checkbox"/> other; please specify: _____</p> <p><input type="checkbox"/> restricted movement; please describe: _____</p> <p><input type="checkbox"/> muscular strain/pain. If so, where? <input type="checkbox"/> neck <input type="checkbox"/> shoulders <input type="checkbox"/> upper back <input type="checkbox"/> lower back <input type="checkbox"/> other; please specify: _____</p> <p><input type="checkbox"/> any other form of discomfort (e.g. noise) please specify: _____</p>	

# Severity and Cause of Discomfort/Pain

<p><i>If you ticked the box in Q3.1.11 indicating that you experienced muscular strain or pain, then please answer the following questions. If not, please continue to Q3.1.14</i></p>	
<p><b>Q3.1.12</b> In relation to the muscular strain or pain, please rate the average intensity of the pain on the following scale:</p>	
<p> <input type="checkbox"/> 0    <input type="checkbox"/> 1    <input type="checkbox"/> 2    <input type="checkbox"/> 3    <input type="checkbox"/> 4    <input type="checkbox"/> 5    <input type="checkbox"/> 6    <input type="checkbox"/> 7    <input type="checkbox"/> 8    <input type="checkbox"/> 9    <input type="checkbox"/> 10                      no pain                      mild pain                      moderate pain                      severe pain                      incapacitating                 </p>	
<p><b>Q3.1.13</b> Has the muscular strain or pain affected your ability to perform operational duties?</p>	<p><input type="checkbox"/> Yes    <input type="checkbox"/> No</p>
<p><b>Q3.1.14</b> Please describe the circumstances when the discomfort is most likely to occur, and state how often?</p>	
<p><b>Q3.1.15</b> In your opinion, what is the cause of the discomfort?</p>	<p> <input type="checkbox"/> poor fit  <input type="checkbox"/> excessive mass  <input type="checkbox"/> operating environment (e.g. hot or cold)  <input type="checkbox"/> failure to integrate with other clothing or equipment.                      Please specify which clothing or equipment the item does not integrate with:                      _____  <input type="checkbox"/> other. Please specify: _____                      _____                 </p>

# Understanding of Function and Purpose

<p><b>Q3.1.17</b> What do you think are the protective functions of aircrew helmets?</p>	
<p><b>Q3.1.18</b> Have you ever received training on the use and purpose of aircrew helmets?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No  <b><i>If 'No', please go to Q3.1.22</i></b></p>
<p><b>Q3.1.19</b> What type of training did you receive?</p>	<p><input type="checkbox"/> briefing    <input type="checkbox"/> demonstration    <input type="checkbox"/> practical use  <input type="checkbox"/> other; please specify:          _____</p>
<p><b>Q3.1.20</b> Who gave the training?</p>	
<p><b>Q3.1.21</b> When was the training given?</p>	

# Durability

<p><b>Q3.1.23</b> Over the last two years, how many times has your helmet been replaced?</p>	<p> <input type="checkbox"/> never    <input type="checkbox"/> once    <input type="checkbox"/> twice    <input type="checkbox"/> 3 times  <input type="checkbox"/> more than 3 times; please specify: _____                 </p>
<p><b>Q3.1.24</b> Why was it replaced?</p>	<p> <input type="checkbox"/> worn out    <input type="checkbox"/> broken    <input type="checkbox"/> no longer fits  <input type="checkbox"/> damaged    <input type="checkbox"/> other; please specify:                      _____                 </p>
<p><b>Q3.1.25</b> Over the last two years, how many times has it been repaired?</p>	<p> <input type="checkbox"/> never    <input type="checkbox"/> once    <input type="checkbox"/> twice    <input type="checkbox"/> 3 times  <input type="checkbox"/> more than 3 times; please specify:                 </p>
<p><b>Q3.1.26</b> Why was it repaired?</p>	

# Survival Aids

<p><b>Q4.1</b> Have you used any issued survival aids in the last 12 months? If 'Yes', please give details.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No.</p>
<p><b>Q4.2</b> Have you used any non-issued survival aids in the last 12 months? If 'Yes' please give details.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No.</p>
<p><b>Q4.3</b> Over the last 12 months, have you supplemented the issued survival aids with any additional items eg head torch?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <b><i>If 'No', please go to Section 5</i></b></p>
<p><b>If 'Yes', please answer the questions below for each non-issued item that you carry</b></p>	
<p><b>Item 1</b></p>	
<p><b>Q4.4</b> Please describe the item</p>	
<p><b>Q4.5</b> Why do you think you need this item?</p>	
<p><b>Q4.6</b> Have you used it? If 'Yes': In your opinion, is it <b>fit for purpose</b>? Please describe the circumstances when you have used this item</p>	<p>1      2      3      4      5</p>

## Questionnaire Distribution

- 500 aircrew to be surveyed at 8 UK military Units:
  - RAF Benson
  - RNAS Culdrose
  - RAF Kinloss
  - RAF Lyneham
  - AAC Dishforth
  - RAF Odiham
  - RAF Waddington
  - RNAS Yeovilton
- Rotary Wing and Multi Engine Aircraft to be surveyed:
  - RW:
    - Lynx
    - Merlin
    - Puma
    - Chinook
    - Sea King
  - LA:
    - Sentry
    - Nimrod
    - C130

## Method of Distribution

- Briefed by QinetiQ and MOD (either DEC TA APS or AE&S IPT RM) to:
  - SERE training Officer or other POC
  - All available aircrew
  - During Feb & Mar 2009
- POC collected questionnaires in sealed envelope (provided) within one week of distribution
- Questionnaires returned to QinetiQ for analysis



Unit	Aircraft Type	Number Distributed	Number Returned to Date	%age returned
Benson	Merlin & Puma	66	18	27
Kinloss	Nimrod	50	33	66
Yeovilton	Sea King & Lynx	150	47	31
Lyneham	C130	150	41	27
Culdrose	Sea King & Merlin	200	69	35
Odiham	Chinook	65	14	22
Waddington	Sentry & Nimrod	40	0	0
Dishforth	Lynx	47	0	0
All		768	222	29

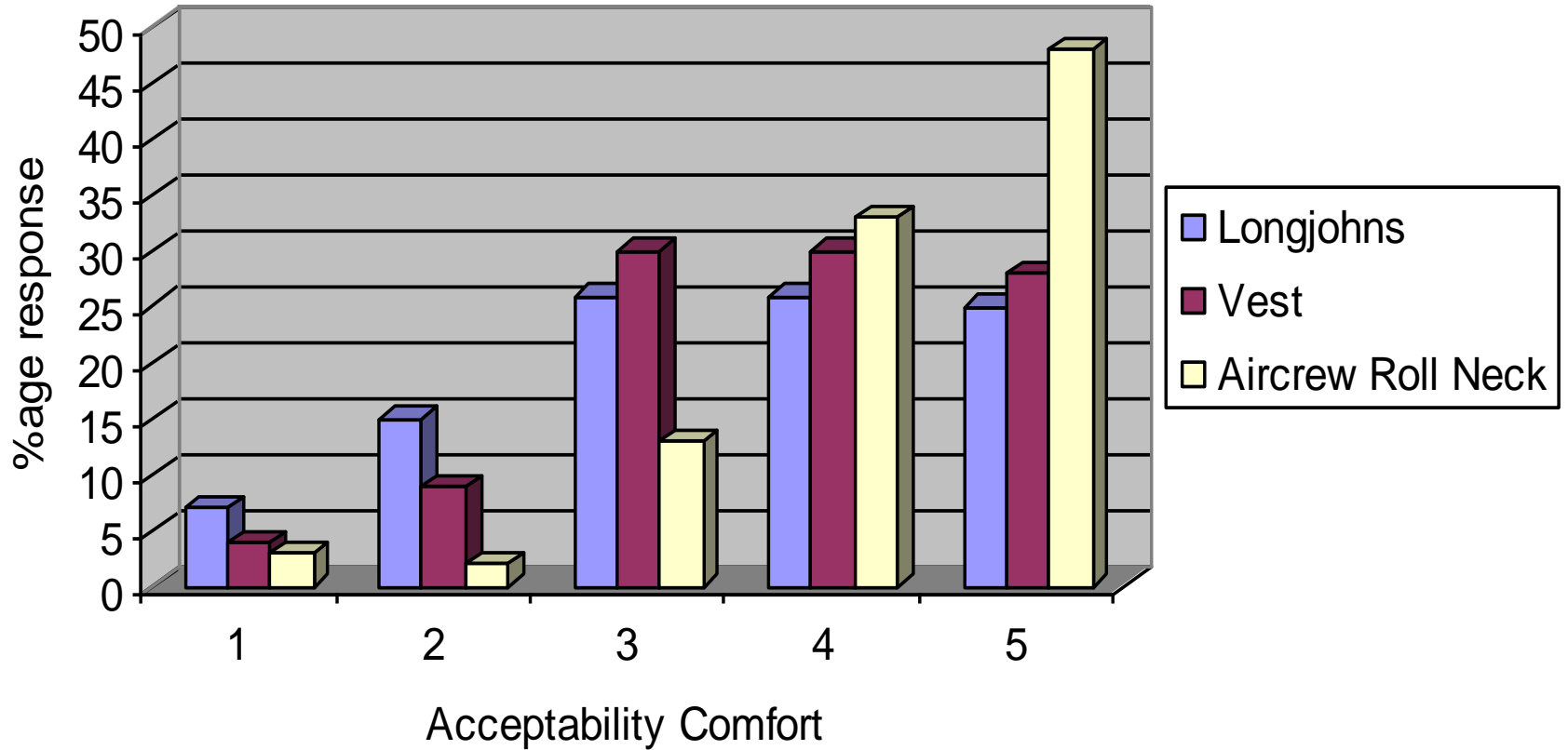
## Questionnaires Returned to Date

- Returned to date: 222
- Data entered to date: 119
  - Platform: 81 rotary wing 38 multiengine
  - Role: 78 front crew 32 rear crew 9 undefined
  - Gender: 9 female 108 male
- Themes Analysed:
  - Inner Layer
  - Helmet
  - Environmental specific clothing – LCV and Immersion Coverall

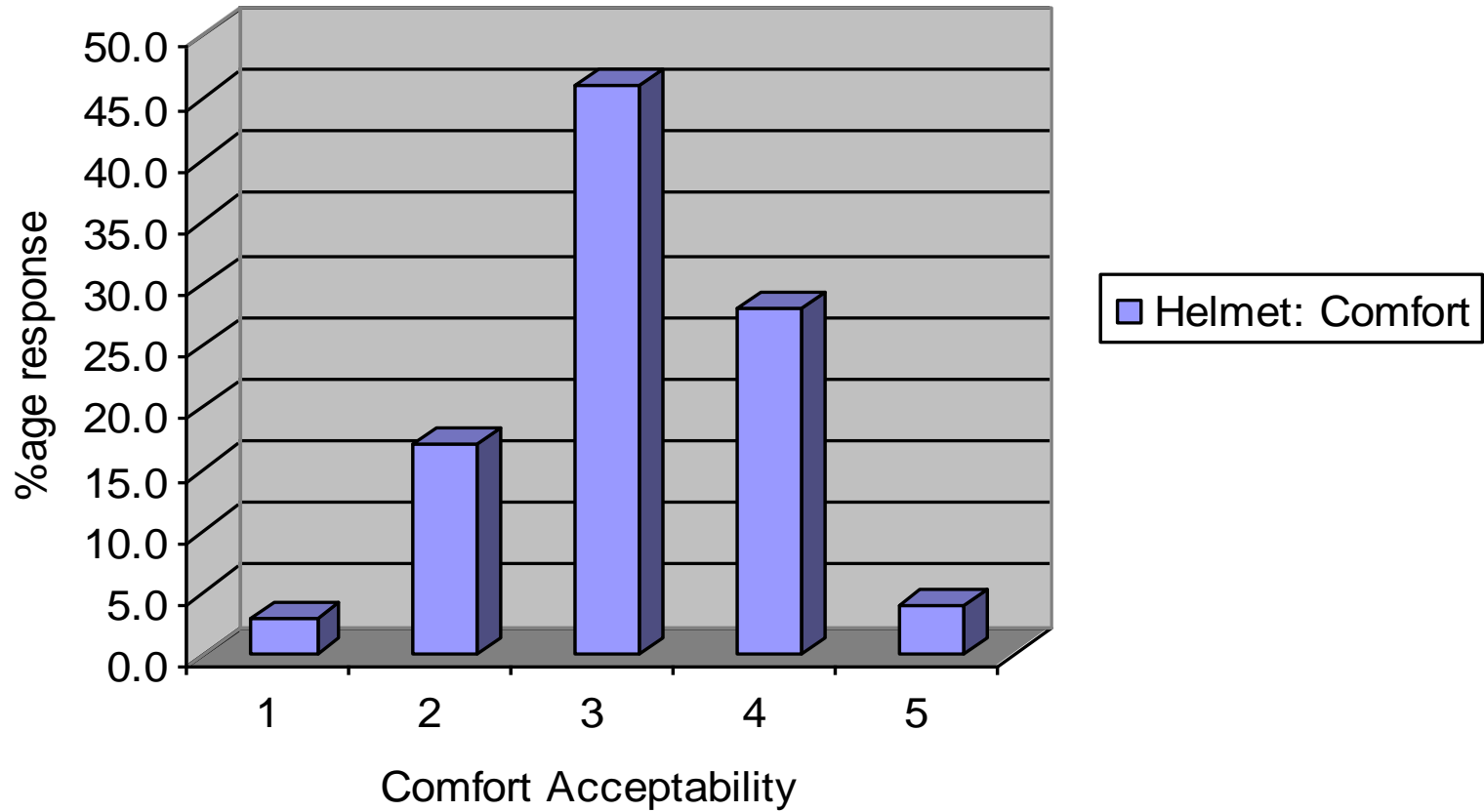
# Usage - Inner Layer

	RW	ME	Total
Aircrew	81	38	119
<b>Long johns worn</b>	<b>70 (86%)</b>	<b>16 (42%)</b>	<b>86</b>
Vest worn	37 (46%)	15 (39%)	52
Roll neck worn	72 (89%)	16 (42%)	88
<b>Vest or Roll Neck Worn</b>	<b>77 (95%)</b>	<b>23 (60%)</b>	<b>100</b>

# Comfort – Inner Layer

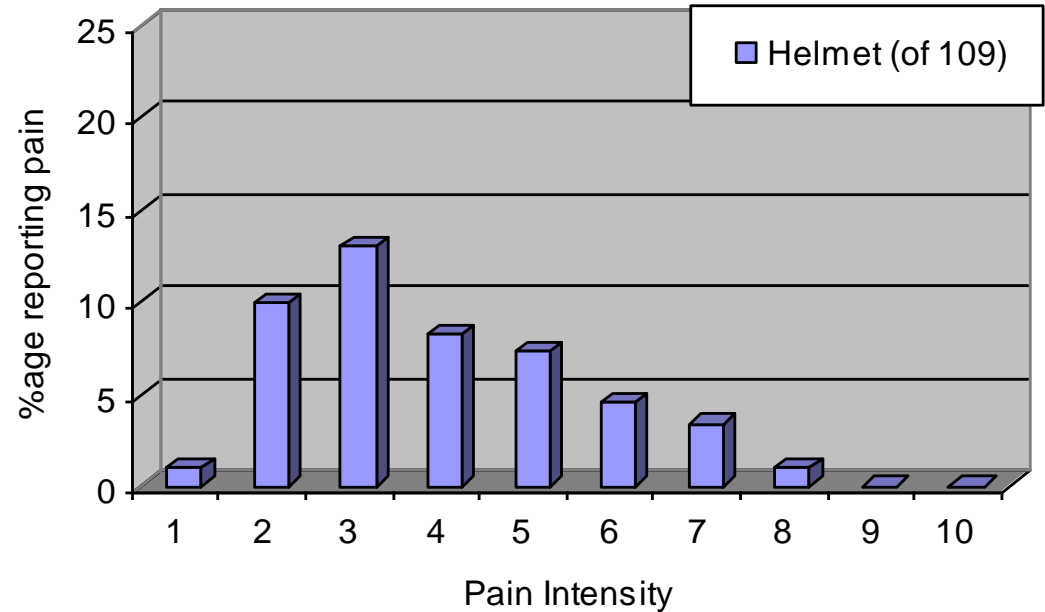


# Comfort - Helmet

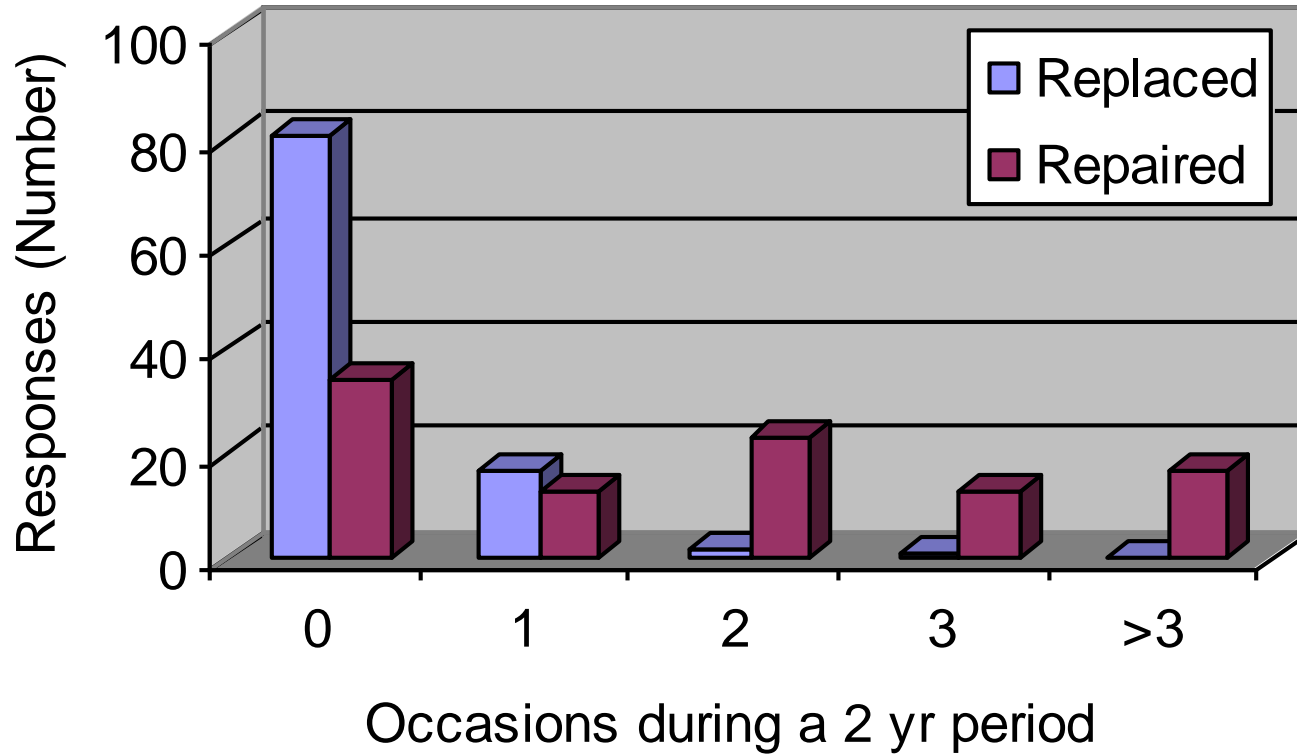


# Pain intensity - Helmet

- Pain scale 0-10
  - 0 no pain
  - 2 mild pain
  - 5 moderate pain
  - 8 severe pain
  - 10 incapacitating pain
- Of 109 wearing a helmet
  - 47 reported pain
  - Attributed to mass, fit, operating environment and integration
  - 10 reported interference with duties



# Durability - Helmet



## Comfort - Immersion Coverall

- 69 of 119 aircrew have worn the immersion coverall
- 25% have worn an immersion coverall more than 50 times in the last 12 months
- 28% rated 1-2 acceptability in terms of comfort
  - Restrictive
  - Difficult to achieve comfort and adequate seal
- 87% scored 3-5 acceptability in terms of fit for purpose



# Liquid Cooled Vest

- Of 81 RW aircrew only 2 have used the in service LCV
  - Puma pilot      Fit for purpose rating 1
  - Chinook ALM    Fit for purpose rating 1
- Reasons for not using the LCV:
  - Not issued/not available: 67
  - Not required:                    11
  - Never seen item:                2
- Of 14 Chinook crew
  - I used LCV
  - 9: Not issued/not seen
  - Only provides 20mins of cooling then useless
  - Tried it once in 2005 and not useable, battery pack too bulky, batteries ran out and vest became an extra layer
  - Totally impractical
  - 1 no reason given

## Non-issued survival aids

- Of 119, 52 aircrew carried at least one item of non-issued equipment

- **Torches:**

– Head torch	33
– Torch	7
– LED torch	4

- **Blades**

– Knife	18
– Multi-tool	7
– Saw	2

- **Survival Equipment**

– ‘Grab bag’	5
– Warm headgear	3
– GPS	2
– Cyalume	2
– Water purifying straw	1
– CAM sheet	1
– Survival blanket	1
– Survival tin	1
– First aid kit	1

# Summary

- Questionnaires collected to date 222 out of 768

– Multi engine	74	Rotary wing	148		
– RN	116	RAF	104	AAC	0

- Future analysis of data and subjective comments by:

- AEA Item
- Aircrew role ie front or rear crew
- Platform type
- Service

- Results will be provided to MOD by late 2009.

***QinetiQ***