

UK Military Rotary Wing and Multi Engine Aircrew Clothing and Issued Equipment Perception Questionnaire

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Scope of the questionnaire

Questions covered all items of aircrew clothing and man mounted equipment, to elicit an understanding of:

- The AEA items worn and not worn for flying duties
- The perceived acceptability of both comfort and function of AEA items
- Items perceived to be resulting in muscular pain or strain
- Perceived cause of discomfort/pain

The questionnaire asked rotary wing and multi engine aircrew to provide answers relating to equipment and clothing they had used for flying duties over the last 12 months.

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

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)

Operational and Non-Operational Variants

- Coverall
- Longjohns
- Vest
- Aircrew Socks
- Boots
- Life Preserver

AEA items addressed

Environment Specific Clothing and 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

Questionnaire distribution

Questions on twenty nine items of AEA in total

Background information eg:

- Role
- Aircraft
- Experience
- Op experience

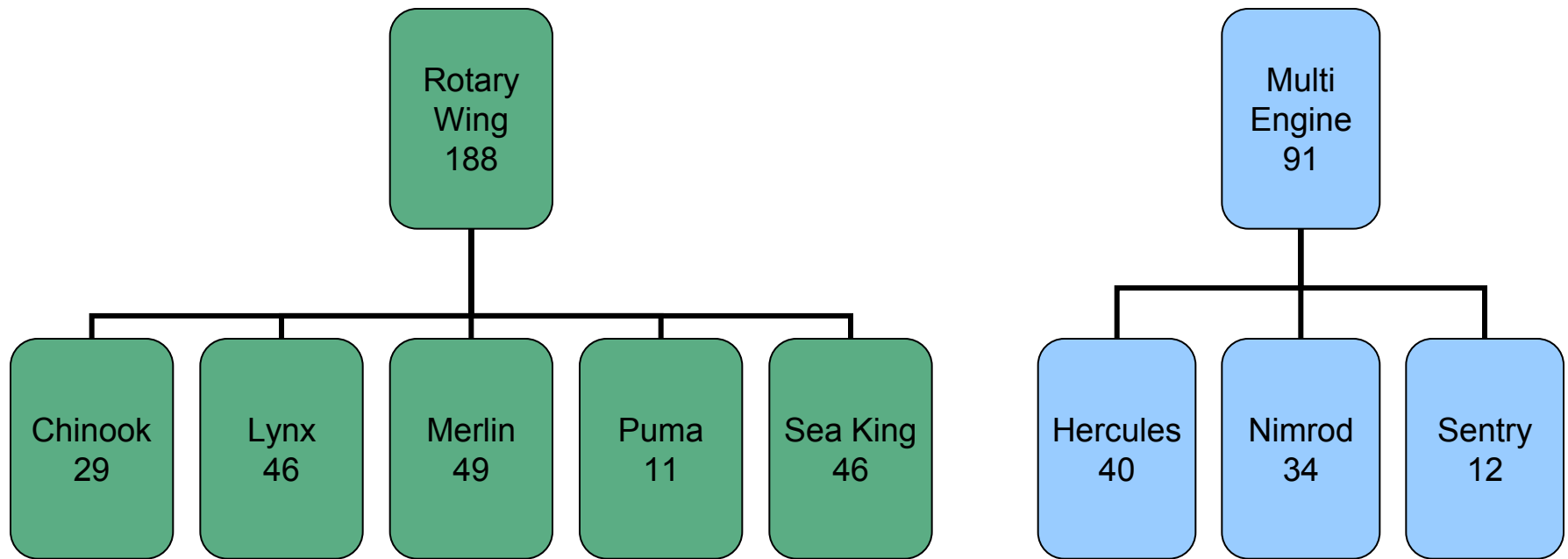
Briefed by QinetiQ and aircrew military sponsor at Units

Unit	Aircraft Type
Benson	Merlin & Puma
Kinloss	Nimrod
Yeovilton	Sea King & Lynx
Lyneham	C130
Culdrose	Sea King & Merlin
Odiham	Chinook
Waddington	Sentry & Nimrod
Dishforth	Lynx

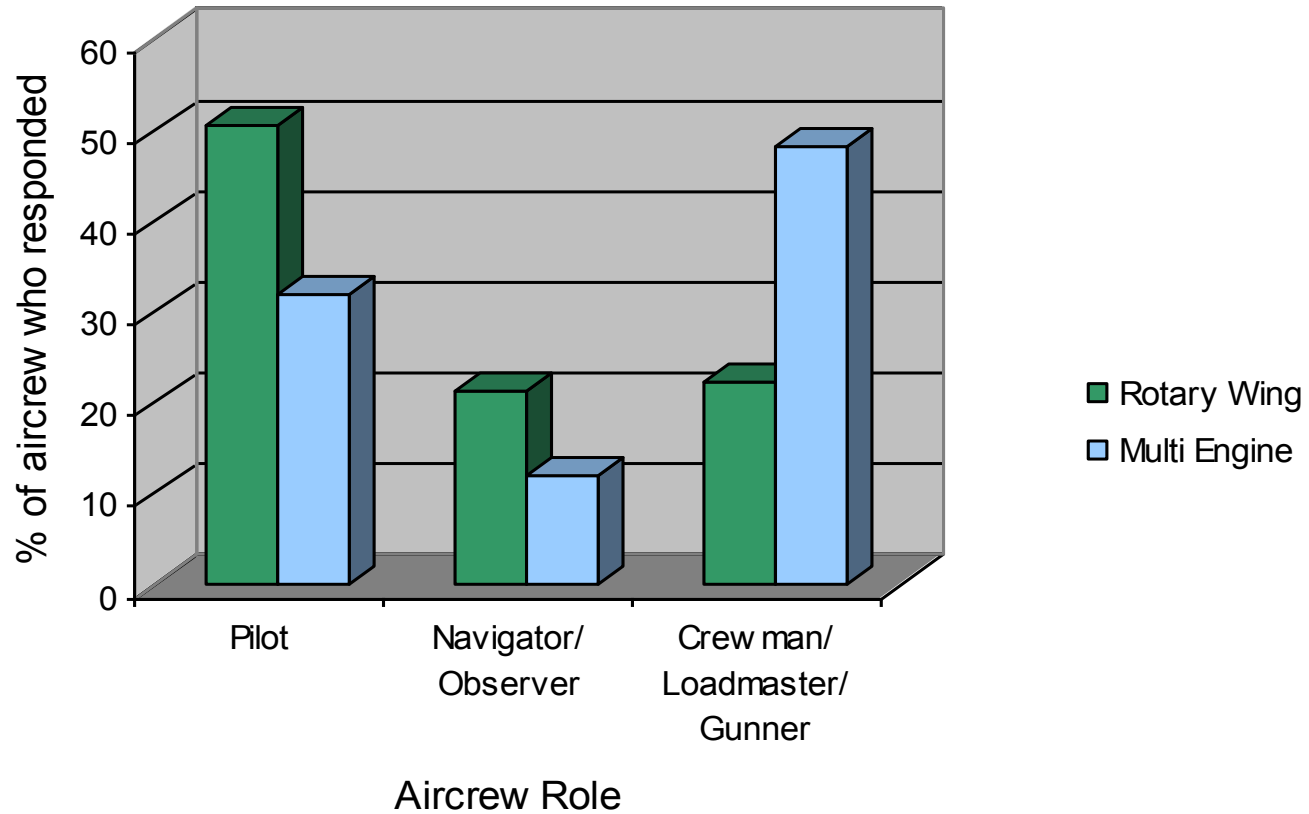
Number of respondents

768 questionnaires were distributed

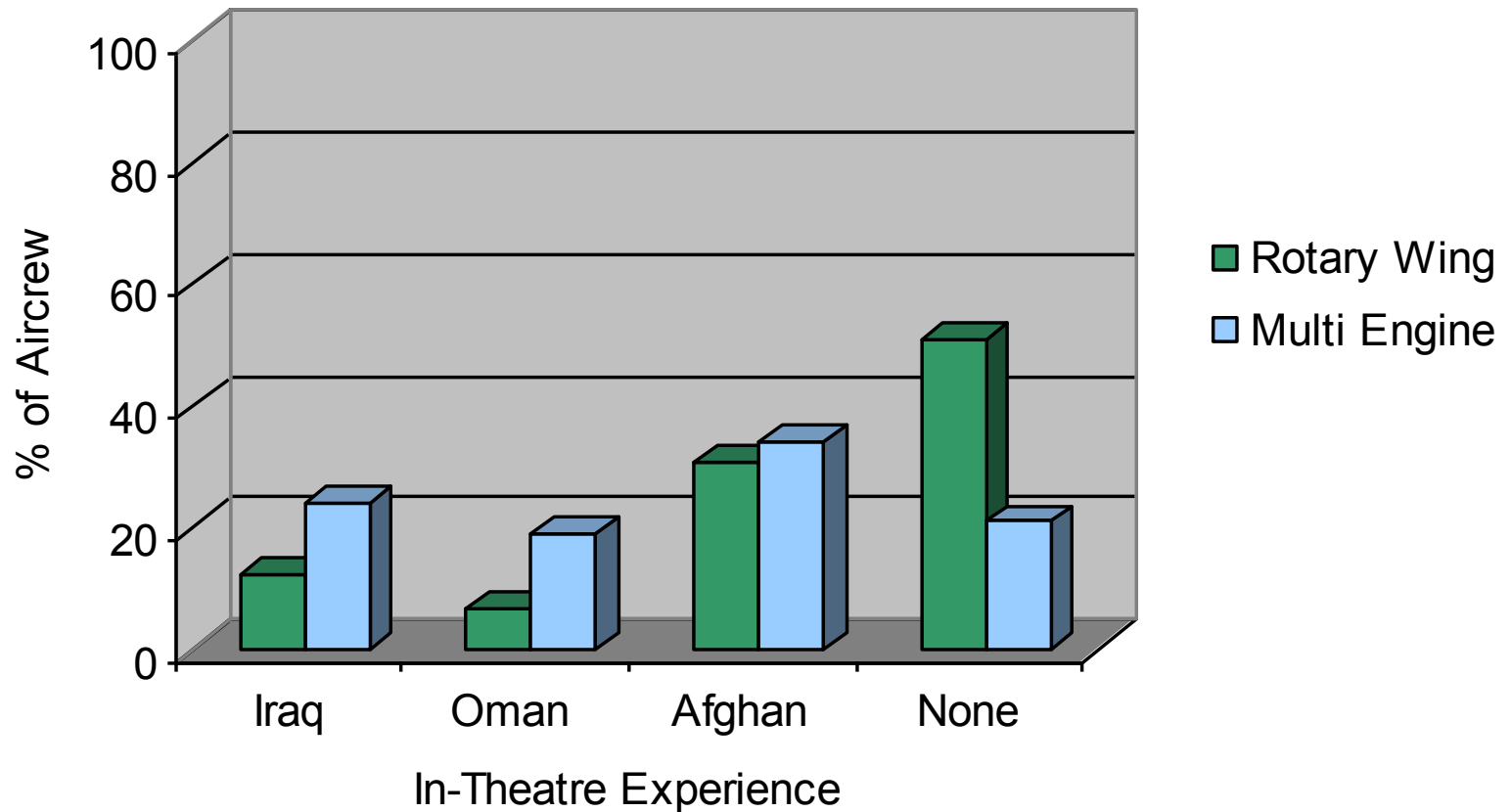
279 were returned completed



Role of respondents



In-Theatre experience of respondents



Questionnaire: Comfort

<p>Q3.1.10 In general, how acceptable do you consider your aircrew helmet to be in terms of comfort (where 1 is unacceptable and 5 is fully acceptable)? Please comment on your rating:</p>	<table style="width: 100%; text-align: center;"> <tr> <td colspan="2">Unacceptable</td> <td colspan="3"></td> <td colspan="2">Fully acceptable</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td colspan="2"></td> </tr> </table>	Unacceptable					Fully acceptable		1	2	3	4	5		
Unacceptable					Fully acceptable										
1	2	3	4	5											
<p>Q3.1.11 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 Q3.1.17</p>															
<ul style="list-style-type: none"> <input type="checkbox"/> excessively hot <input type="checkbox"/> excessively cold <input type="checkbox"/> pressure points. If so, where? <ul style="list-style-type: none"> <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: <input type="checkbox"/> restricted movement; please describe: <input type="checkbox"/> restricted movement; please describe: <input type="checkbox"/> muscular strain/pain. If so, where? <ul style="list-style-type: none"> <input type="checkbox"/> neck <input type="checkbox"/> shoulders <input type="checkbox"/> upper back <input type="checkbox"/> lower back <input type="checkbox"/> other; please specify: <input type="checkbox"/> any other form of discomfort (e.g. noise) please specify: 															

Questionnaire: Discomfort cause

Helmet

Q3.1.15 In your opinion, what is the cause of the discomfort?

- poor fit
 - excessive mass
 - operating environment (e.g. hot or cold)
 - failure to integrate with other clothing or equipment.
- Please specify which clothing or equipment the item does not integrate with:

other. Please specify: _____

FRCS 95 Jacket

Q3.15.7 In your opinion, what is the cause of the discomfort?

- poor fit
- operating environment (e.g. hot or cold)
- failure to integrate with other clothing or equipment.
- material characteristics




Please specify which clothing or equipment the item does not integrate with:

other. Please specify: _____

Comfort Ratings: Head mounted equipment

Item	Rotary Wing Aircrew – Comfort Percentage of responses in ratings 1 to 5					Number of responses
	1	2	3	4	5	
Aircrew Helmet	3.3	14.2	41.0	37.2	4.4	183
NVDs	11.5	41.8	32.0	14.8	0.0	122

Comfort rating reported by RW aircrew on helmet and NVG, assessed on a scale of 1 to 5, where 1=unacceptable and 5=fully acceptable.

- 10-19 (-) 
- 20-29 (-) 
- >30 (-) 
- >40 (+) 
- >60 (+) 

Type of comfort: Head mounted equipment

Item	RW Aircrew wearing item	Type of Discomfort (%)				
		Hot	Cold	Restricted movement	Pressure points	Pain/ strain
Helmet	188	18	0.5	7	57	45
NVDs	129			26	50	69

Perceived cause of comfort: Head mounted equipment

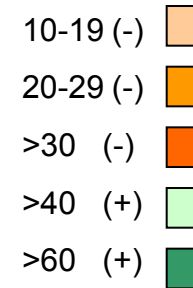
Item	RW Aircrew wearing item	Type of Discomfort (%)				
		Hot	Cold	Restricted movement	Pressure points	Pain/strain
Helmet	188	18	0.5	7	57	45
NVDs	129			26	50	69

Item	RW Aircrew wearing item	Cause of discomfort (%)			
		Poor fit	Operating environ (hot/cold)	Mass	Failure to integrate
Helmet	188	18	16	44	10
NVDs	129	13	12	72	9

Perceived acceptability of comfort

Item	Rotary Wing Aircrew – Comfort Percentage of responses in ratings 1 to 5					Number of responses
	1	2	3	4	5	
FRCS 95	2.5	10.0	17.5	50.0	20.0	80
FRCS 95 - jacket	0.0	0.0	8.0	40.0	52.0	25
Combat aircrew suit	0.0	6.0	20.0	32.0	42.0	50
Cold Weather Flying Suit	2.1	1.0	16.7	38.5	41.7	96
Immersion Coverall	6.3	20.8	40.9	26.4	5.7	159
Knitted inner coverall	3.5	10.5	26.3	33.3	26.3	114
LCV	83.3	16.7	0.0	0.0	0.0	6
Life preserver*	5.2	19.1	37.4	31.3	7.0	115
Protective body armour	2.3	14.0	48.8	27.9	7.0	43

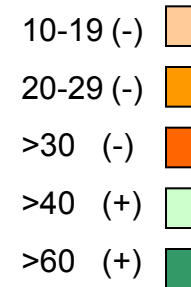
Comfort rating reported by RW aircrew on environment specific clothing, assessed on a scale of 1 to 5, where 1=unacceptable and 5=fully acceptable.



Perceived acceptability of comfort

Item	Rotary Wing Aircrew – Comfort Percentage of responses in ratings 1 to 5					Number of responses
	1	2	3	4	5	
Coverall*	0.8	4.9	19.5	39.8	35.0	123
Longjohns*	5.9	11.8	20.2	31.9	30.3	119
Aircrew Vest*	6.8	12.2	24.3	29.7	27.0	74
Aircrew socks*	3.3	2.5	11.7	30.0	52.5	120
Aircrew jersey	0.0	4.3	15.2	41.3	39.1	46
Aircrew roll neck	1.8	2.3	13.5	35.7	46.8	171
Aircrew gloves	0.0	4.5	17.4	37.4	40.6	155

Comfort basic AEA reported by RW aircrew, assessed on a scale of 1 to 5, where 1=unacceptable and 5=fully acceptable.



Perceived cause of comfort

Item (below neck only)	Aircrew wearing item	Type of Discomfort(%)				Cause of discomfort(%)			
		Hot	Cold	Restricted Movement	Pressure points	Poor fit	Operating environ (hot/cold)	Material characterc	Failure to integrate
Longjohns (Ops)	223	19	1	4		6	13	10	1
Longjohns (Non-ops)		9	2	4		8	8	6	1
Vest (Ops)	125	16	0	4		6	16	10	2
Vest (Non-Ops)		7	3	4		7	6	4	3
FRCS95 shirt and trousers	121	27	2	2	1	10	26	21	2

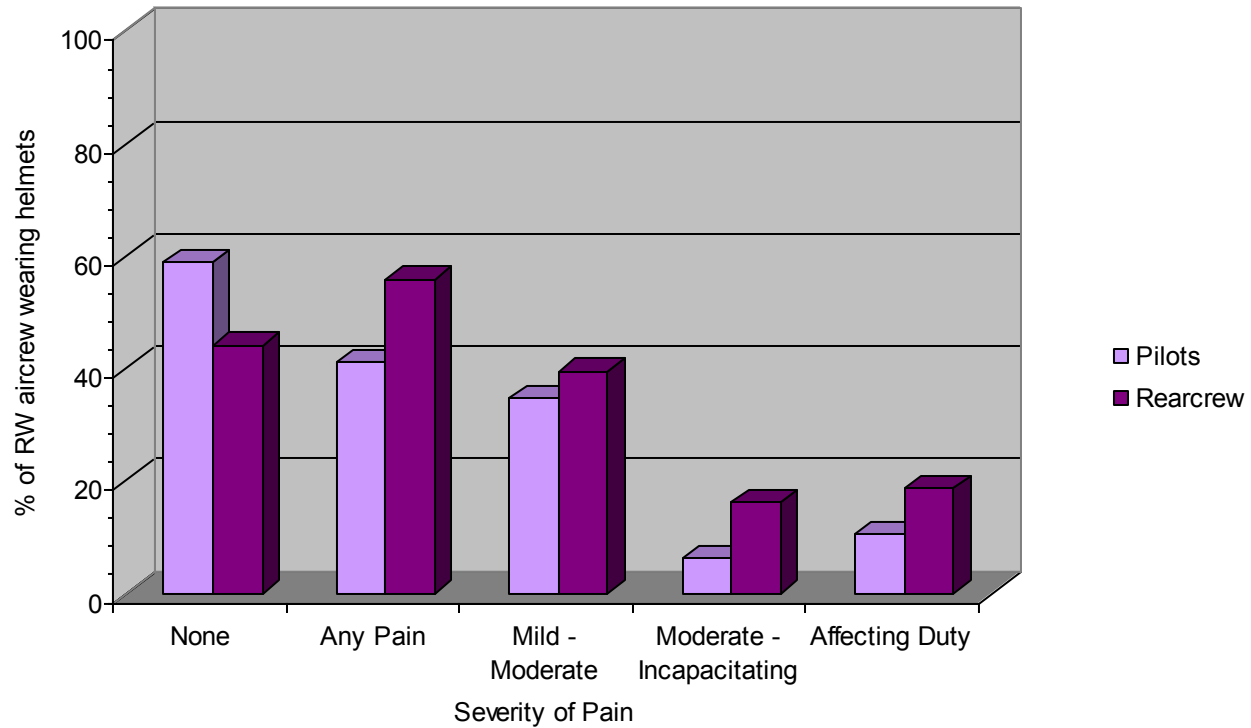
Perceived cause of comfort

Item (below neck only)	Aircrew wearing item	Type of Discomfort(%)				Cause of discomfort(%)			
		Hot	Cold	Restricted Movement	Pressure points	Poor fit	Operating environ (hot/cold)	Material characterc	Failure to integrat e
Life preserver (Ops)	250	12	1	17	10	12	7	7	7
Life preserver (Non-Ops)		3	0	14	5	14	1	5	7
Immersion coverall	163	29	4	45	16	21	17	47	8
Knitted inner coverall	116	20	1	5		3	13		5

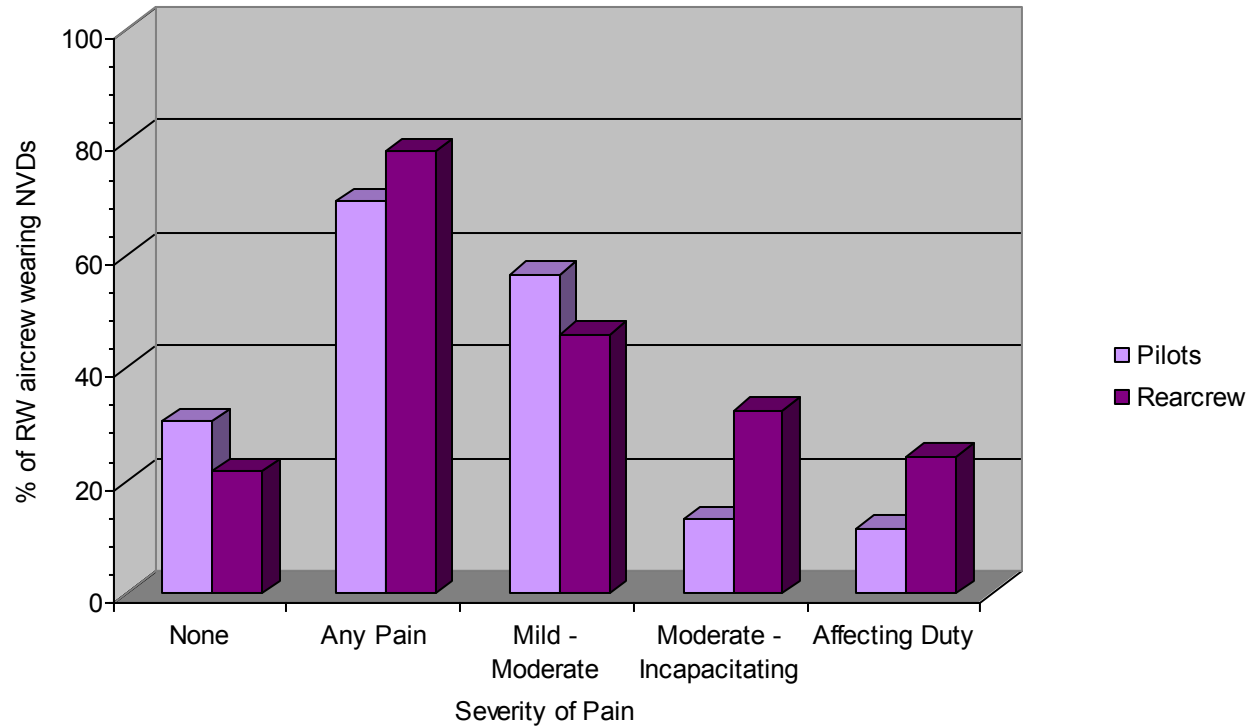
Questionnaire: Pain

<p>Q3.1.12 In relation to the muscular strain or pain, please rate the average intensity of the pain on the following scale:</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>Q3.1.13 Has the muscular strain or pain affected your ability to perform operational duties?</p>						<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>				

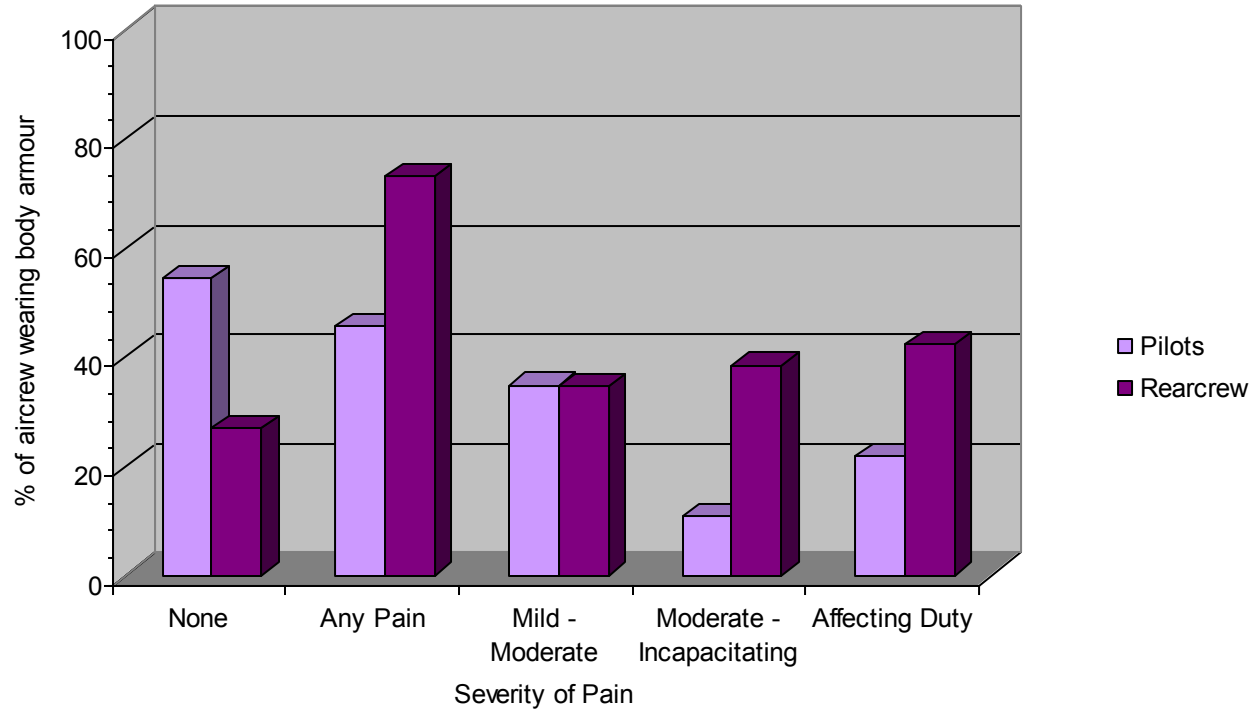
Pain associated with helmets



Pain associated with NVDs



Pain associated with body armour



Conclusions

From a comfort perspective, this population of aircrew reported the greatest number of issues with:

- Pressure points resulting from helmet; and helmet mass
- Muscular pain resulting from NVDs; and NVD mass
- Restricted movement resulting from the life preserver; and life preserver fit
- Excessive heat resulting FRCS95; and material characteristics (on Ops)
- Excessive heat longjohns & vest; material characteristics (on Ops)
- Restricted movement resulting from immersion coverall; material characteristics and fit.

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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

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