

Aircrew Systems Shortfalls and Priorities

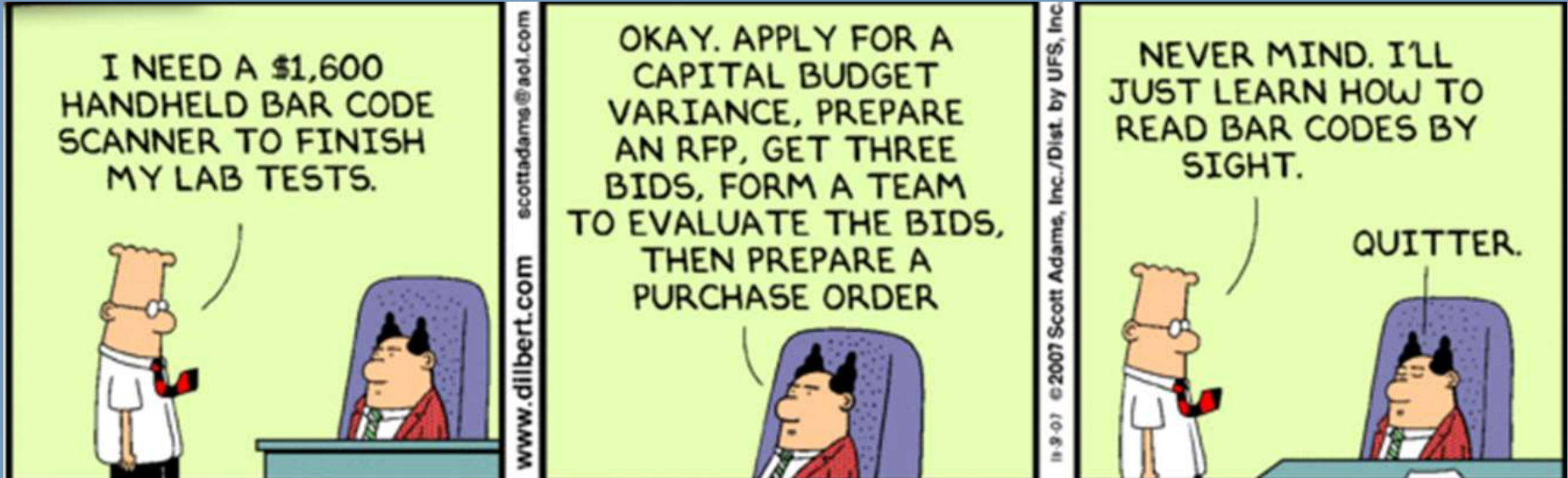
SAFE (Europe) Symposium 2016

Squadron Leader Colin Welsh

SO2 Air Enablers

Air Capability, HQ Air Command

Introduction



Scope

- Aircrew Systems Mandate
- Background
 - Defence Reform Report, 2011, Lord Levene
 - Review of Acquisition, 2009, Bernard Gray
 - The Nimrod Review, 2009, Charles Haddon-Cave QC
 - Defence and Securities Public Contract Regs, 2011
 - Operational Context inc SDSR
- Current Aircrew Systems projects
- Shortfalls and Priorities
- Trends
- Questions

Aircrew Systems Mandate

“UK MOD personnel whose employment involves the direct operation of, or carriage in, an air vehicle shall, as far as is reasonably practicable, be protected both from immediate and long term adverse effects of any equipment they might be required to use in the course of their duties and from the conditions in the hostile, natural and man-made environments in which they might be expected to operate during training, routine, operational, emergency or accident situations, such that they can maintain and continue to exploit their peak operational capabilities”

Background



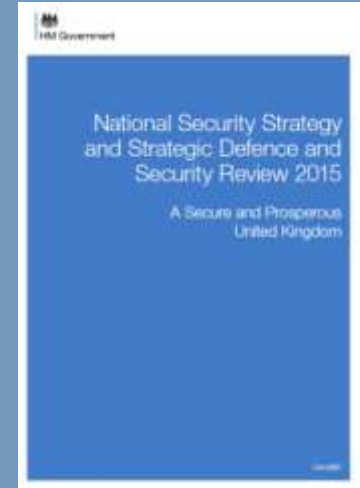
- Lord Levene, Defence Reform Report
 - 53 recommendations
 - *“The Service Chiefs should be responsible for generating and developing their Service in line with that strategic direction and within the budget set.”*
 - Delegated Operating Model
 - Commands accountable for equipment and support
 - Service Chiefs given freedom to prioritise *“within budgets”*
 - Adoption of MSP methodology
- Bernard Gray, Defence Acquisition Reform
 - Government-Owned, Contractor-Operated Entity
 - *“World-class programme management organisation”*
 - Move to increasingly contractual relationship

Background

- The Nimrod Review, Charles Haddon-Cave
 - New Airworthiness Regime, under MAA
 - Accountability for Risk
 - Duty Holder Construct
 - Tolerable and ALARP
- Defence and Securities Public Contract Regulations
 - Equal treatment to all, non-discrimination, transparency
 - Requirements advertised in the Official Journal of EU
 - Requirements over £10K should be advertised on Contracts Finder



Background



- Operational Context
 - Unstable World
 - Increasing Operational Demand
 - Air Environment, especially ISTAR, crucial in current campaigns
 - Media and public interest less focussed than Afghanistan Campaign
- SDSR
 - Strategic Direction
 - Redefines TLB allocations for Directed Capabilities required to support Strategic Direction

Current Projects

- Development Space:
 - Aircrew Systems Research
 - Laser Eye Protection
 - NVD/IIT Refresh
 - FJ Urination Solutions
 - Future Integrated Visual Enablers Research
 - Joint Aircrew CBRN Ensemble (via Proj PATSY)



Current Projects

- Delivery Space:
 - Emergency Personnel Locator Beacon
 - Hawk TMk1/1A Collision Warning System and GPS Upgrade
 - Options for GPWS/Radalt



Current Projects

- In-Service (Business as Usual) Space:
 - Future Aircrew Clothing System
 - Boots and Socks
 - Immersion Protection Garment
 - Anti-G Trousers
 - Body Armour and Load Carriage System
 - Mk42/43 LSJs
 - In-Ear Communications Device
 - Refresh NVD/IITs
 - Cold Weather Clothing



Shortfalls and Prioritisation

- Theoretically, equipment Shortfalls managed by direct engagement between ‘using’ organisation and ‘supporting’ organisation
 - Challenging in practice due to wide range of users of each item and large number of ‘using’ organisations
 - Air Capability ‘leans’ into the in-service space to assist from an pan-defence perspective
- Research, knowledge and evidence shortfalls are listed, weighted and scored annually by user representatives and AvMed community

Shortfalls and Prioritisation

18	Inadequate methods to attenuate noise at the ear in order to meet EU legislation and reduce long term hearing damage while preserving situational awareness	3	3	2	1	2	2	3	2	15	3	6
5	Inadequate awareness of ground wires/masts	3	2	2	2	1	3	3	1	14	3	6
25	Mass, centre of mass, poor stability of head mounted equipment causing neck pain & injuries.	3	1	2	2	2	2	2	2	13	3	6
26	Lack of understanding of the relationship between head mounted mass properties, positioning, G, and MSI. Lack of understanding of associated implications.	3	1	2	2	2	2	2	2	13	3	6
15	Lack of agile laser eye protection solution to meet changing/future threats	3	1	1	2	2	2	2	2	12	3	6
47	Crash protection systems for crews and passengers may not be ALARP (seating and harnesses).	3	1	0	3	3	0	3	2	12	3	6
63	lack of understanding of prevalence of aircrew fatigue	3	2	3	2	2	0	2	1	12	3	6
11	Inadequate laser eye protection - integration	3	1	0	2	2	2	2	2	11	3	6
12	Inadequate laser eye protection - effect on vision	3	1	0	2	2	2	2	2	11	3	6
13	Inadequate laser eye protection - protection	3	1	0	2	2	2	2	2	11	3	6
32	Lack of understanding of the insulation provided by the current AEA, individually and as a system	3	2	2	1	1	0	3	1	10	3	6
64	lack of effective mitigation for aircrew fatigue	3	0	2	2	2	0	3	1	10	3	6
34	Incoherent planning tools to inform operators of AEA required for cold survival and hot weather operations.	3	0	2	2	1	0	3	1	9	2	5

Shortfall Categories

- Situational Awareness
- Spatial Disorientation
- Visual Capability
- Integration
- Aircrew Equipment Assemblies
- Musculoskeletal Injury Prevention
- Assisted Escape
- Post Escape Survival
- Fatigue Protection
- Altitude Protection
- G Protection
- Whole Body Crash Protection
- Head Protection
- Thermal Protection
- Ocular Protection
- Noise Protection
- CBRN Protection

Shortfall Examples



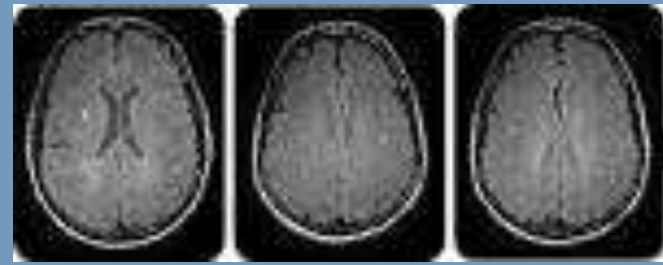
- Noise Protection
 - Inadequate methods to attenuate noise at the ear in order to meet EU legislation and reduce long term hearing damage while preserving situational awareness
 - lack of understanding of the effects of infrequent exposure to continuous noise
- Musculoskeletal Injury Prevention
 - Mass, centre of mass, poor stability of head mounted equipment causing neck pain & injuries
 - Lack of understanding of the relationship between platform ergonomics and musculoskeletal injury

Shortfall Examples



- Ocular Protection
 - Lack of agile laser eye protection solution to meet changing/future threats
 - Lack of laser dazzle training
- Visual Capability
 - Lack of operational capability in degraded visual environments
 - Current NVDs provide inadequate field of view
- Thermal Protection
 - Incoherent planning tools to inform operators of AEA required for cold survival and hot weather operations

Shortfall Examples



- G Protection
 - Effect of acceleration atelectasis on G tolerance and hypoxia
 - Acceleration atelectasis and breathing gas mix
- Altitude Protection
 - White matter lesions resulting from altitude exposures
- Head Protection
 - Legacy helmets not Defstan 05-102 (MAHIS) compliant

Shortfall Examples



- Fatigue Protection
 - Lack of understanding of prevalence of aircrew fatigue
 - Lack of effective mitigation for aircrew fatigue
 - lack of understanding of implications of adrenaline on sleep inertia
- Aircrew Equipment Assemblies
 - Inadequate legacy AEA including gloves, immersion protection garment (IPG), items not covered by future aircrew clothing strategy (FACS) not meeting current requirements
 - Lack of adequate provision of an in-flight urination capability

Trends



- As costs increase against capped resources, more squeeze on all Enablers
- ‘System’ Procurements for future platforms
- Joint Procurements for legacy platforms
 - Pan-defence requirements
 - Compromises required
 - vs tolerable and ALARP?
 - More COTS/MOTS procurements
- Collaborative development with international partners
 - NATO Logistics Stock Exchange (NLSE)

Questions?



How the customer explained it



How the project leader understood it



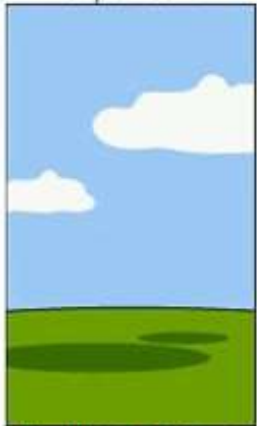
How the engineer designed it



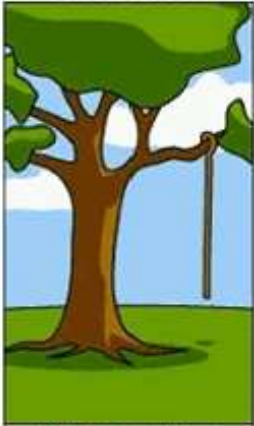
How the programmer wrote it



How the sales executive described it



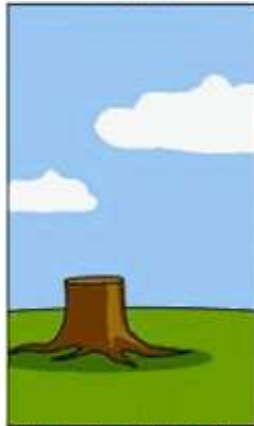
How the project was documented



What operations installed



How the customer was billed



How the helpdesk supported it



What the customer really needed