

The logo for the Weapons Technology Centre, featuring the words "WEAPONS", "TECHNOLOGY", and "CENTRE" stacked vertically in a white, sans-serif font. The text is centered within a dark purple square background that has a subtle grid pattern.

Weapons Technology Centre Response to the Green Paper on Equipment, Support and Technology for UK Defence and Security

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Introduction

“Deliver timely, battle-winning technology solutions for Complex Weapons that are mutually beneficial to MOD and Industry”

Weapons Technology Centre (WTC) Vision

This paper is an organisational response to the Green Paper on Equipment, Support and Technology for UK Defence and Security on behalf of the 33 industrial partners of the Weapons Technology Centre (WTC) that comprises a mix of primes, technology and sub-system providers, SMEs, consultants and academia: see Annex A for a list of the industrial partners.

This response has been collated after a discussion on the Green Paper between MOD and the industrial partners at a regular WTC briefing event on the 1st March 2011, and a consensus agreement to generate a collective WTC response from the industrial members. Inputs specific to the complex weapons (CW) domain were then solicited from each industrial partner, recognising that typically individual company responses would be much broader than the scope of the WTC. This response was subsequently generated and circulated for review and comment by the industrial partners prior to its submission.

The WTC has delivered a successful change programme for the management of research in the CW domain, and we are looking for the policy resulting from this consultation to support our approach and its continued improvement. We also offer in to the consultation process our experience from this change programme as it may have benefits into other sectors across defence and security. However, it is important to recognise that ‘one size’ does not necessarily fit all in terms of the benefits that can be delivered in adopting a WTC style of approach.

Background

Team Complex Weapons (Team CW) was established in July 2007 as a Joint MOD/Industry Team with MOD, MBDA, THALES, QinetiQ and ROXEL for the development and deployment of CW.

Formed to meet the changing needs of the MOD and industry participants Team CW serves to adopt a much more collaborative approach to working which will transform and sustain our business. It provides the highest level of governance for all CW pipeline procurement programmes to ensure the sustainment of operational advantage and freedom of action in this important area of delivering precision weapon systems.

The WTC has been established to be an integral part of the Team CW approach to deliver a coherent research programme which enables new technology to be exploited in current and future products.

Aims of the Weapons Technology Centre

The WTC, formerly the Complex Weapons Centre for Defence Technology (CW CDT), was set up and established during 2008 and has been a successful change programme delivering a partnering approach to the management of CW research.

“[The CW CDT is] an important pathfinding team ... breaking new ground”
Dr Chris Mace
June 2009

The overarching vision of the WTC is to provide a coherent portfolio of research and technology investment comprising industry PV investment and MOD funds. PV investment is expected to at least match the management function costs in FY10 and beyond that with goals of 30% of programme volume PV investment at year 3 and 50% of programme volume PV investment at year 5.

The WTC is currently funded to plan, task and deliver CW research in the order of £10M within FY11/12 and is on track to achieve in excess of £3M of industry PV alignment by the end of the FY.

The WTC has been an integral part of the successful establishment of Team CW and the approach to technology management in the CW domain that addresses both equipment programme and equipment support needs. It delivers coherence and partnering that enables:

- a) The planning of research with technology exploitation at its core;
- b) Wide stakeholder buy-in from across MOD and industry;
- c) Alignment of industrial PV investment with MOD research funding;
- d) A portfolio approach to research management for the CW sector.

“significant challenge in realising the future complex weapons vision is addressing technology development and insertion in future epochs. This has made us focus more on collaborative technology plans across team Complex Weapons. The CW CDT ... has been set up [to] provide an efficient and co-ordinated approach to all phases of research and technology”
Alan Nicholl,
Director Weapons,
DE&S
Feb 2010

Characteristics of the Weapons Sector

The success of the WTC has been based upon recognising and embracing key characteristics of the CW sector. It is the view of the industrial partners of the WTC that the policy development arising out of this consultation process should seek to address key characteristics of individual domains, as they vary across the breadth of UK defence and security. Key characteristics of the complex weapons sector include the following:

- a) Appropriate knowledge and capability in the design and ownership of weapons is essential to deliver operational advantage and freedom of action. Considerations of commonality, modularity and re-use across a portfolio of weapon systems have been a key aspect in how Team CW has addressed future Cost of Ownership (COO) and exportability. However it may be considered that future systems need to be designed for export to a low budget then adapted technically to deliver a higher level of performance for UK defence and security;

- b) Safety and duty of care in the ownership of weapon systems, which has a significant impact upon whole life costs and thus the aspiration to maximise capability within a fixed or falling procurement budget;

- c) Sustainment and growth is required, where appropriate, in key technology areas to support operational advantage, freedom of action and duty of care. This leads to bespoke national projects rather than COTS procurements, and increasingly to bespoke bi-national/collaborative projects through key bi-lateral relationships;

- d) There is overcapacity in the supply chain owing to falling procurement levels and the need to rationalise a vulnerable community in a coherent fashion to maintain operational advantage, freedom of action and duty of care;

- e) Exports are an essential market for a number of companies in the supply chain, providing the opportunity for synergy between supporting world class UK companies and operational advantage and freedom of action for the UK. Exports are enabled by Government and this serves to lead across the sector in not only supporting the supply chain but in driving the economy. Greater offshore investment will impact UK industrial capability and so MOD needs to align its industrial and export strategy.

Weapons Technology Centre – Success Factors

“All too often, the military customers and their capability requirements appear to be isolated from the R&D planning and delivery processes. A systematic, rigorously implemented, R&D process should ensure that the military customer and relevant industries are fully engaged throughout the life cycle

Sir Edmund Burton, Review of MOD R&D coherency, October 2009

“The CW CDT [provides] a very solid foundation on which to build the future co-ordination of highly cost-effective CW research leading to the right weapons in the right timescale”
*Phil Jones,
Managing Director,
TME
Apr 2010*

There are a number of key aspects that underpin the successful operation of the WTC that we are looking for the resultant policy to support and facilitate rather than inhibit or prevent.

- a) Recognising that both MOD (DE&S, Capability Areas) and industry are stakeholders in identification of the needs and drivers for technology research to underpin future equipment procurement and equipment support functions. MOD organisational constructs, such as the Weapons Operating Centre in DE&S and the Weapons Domain in the Dstl Programme Office (and formerly in DTIC), and their partnering approach with industry have been an important enabler.

b) The intent of the WTC process is to ensure that the research plan reflects the joint needs and priorities of the stakeholders and, above all, subject to successful delivery of the projects, carries a high probability of exploitation.

c) Joint MOD and Industrial decision-making by the main investor stakeholders taking into account a broad range of factors such as industrial PV alignment, export issues and sustainment of key technologies. The WTC provides a forum through which the MOD and WTC partners can agree which key technologies require research investment.

d) A core MOD and industry team driving the management of the planning, tasking and delivery of research, responsible for the wide stakeholder engagement and realising the partnering approach.

e) Drawing upon the best technical expertise from across MOD and the industrial supplier base to advise on priority research activities to address the needs and gaps identified by the stakeholders; addressing both procurement equipment and procurement support issues and forming new groupings of expertise as required. The WTC approach enables a healthy and challenging debate between the Subject Matter Experts from the broad spectrum of WTC partners, and as a result of bringing the community together we are able to strive for cutting edge performance and bring the best of the sector and not just the best of the primes.

f) Openness: providing the visibility of, for example, the procurement pipeline, investment decisions and a 5-year research plan to all the partners in the supplier base.

g) Open competition of all research contracts, providing the opportunity to all to compete for the leadership of the work, and then working with the selected lead to put in place the best programme drawing upon expertise from across the whole research supplier base.

h) Adaptability & flexibility: including partnering behaviours to veer & haul within research contracts to adapt to changing priorities and needs, and provision of a forum to solicit feedback from partners to improve the approach to research management.

Sustainment of Operational Advantage and Freedom of Action

The CW domain is dependent on several key technologies and capabilities and also needs to be able to draw on specialist skills, many of which only exist within the defence sector. The WTC believes that MOD must consider the totality of UK capability (in academia, pan-industry and within government) when it makes sustainment decisions to protect operational advantage and freedom of action; and in particular what support it will

require to make procurement decisions and in understanding the threats from opponents' precision weapon systems.

The WTC considers that the UK scenario for weapons has been significantly enhanced by initiatives such as MASS (Munitions Acquisition – The Supply Solution) and Team CW and the establishment of the Weapons Operating Centre. Such initiatives should be allowed to further mature before a fully open competition procurement process is adopted. Strong UK Industrial Participation is also deemed essential for retention of capability if more open procurement policies are to be followed in the future.

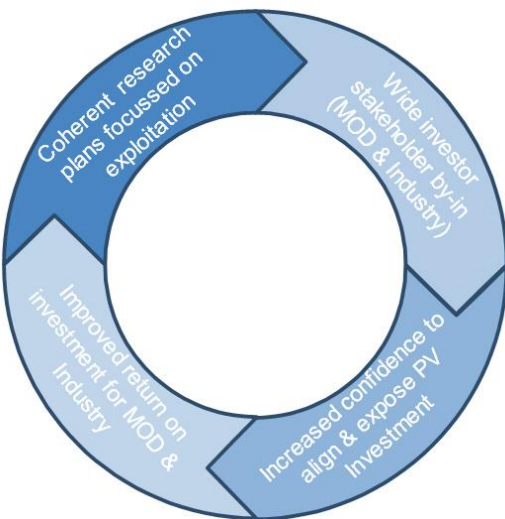
Technology, Innovation and Exploitation

Within the CW Domain, MOD and Industry have jointly identified key technologies needed to support MOD procurement decisions. This joint approach can also be used to identify where technology, and thus investment, needs to be bespoke for weapon system or can leverage (or spin back-out in to) from cross-cutting technologies. The WTC Balance of Investment (BOI) process has successfully demonstrated how multiple criteria of importance to MOD and industrial stakeholders, and long term and medium term requirements can be balanced to generate coherent research programmes with 'buy-in' from across the investor stakeholders from MOD and Industry.

Both innovation and SME engagement in the CW area has been supported by the WTC, the Anglo-French MCM ITP (Materials and Components for Missiles Innovative Technology Partnership) and WTC-sponsored CDE (Centre for Defence Enterprise) calls. However MOD needs to recognise that SMEs can face relatively higher financial and commercial exposure during the exploitation of technology advancements than industrial Primes. SMEs would therefore benefit from better clarity on MOD's position regarding the use and protection of Intellectual Property (IP).

The continued early insight by Industry of MOD's future capability needs and technology drivers is essential if industry is to have the confidence to align PV investment into technology development. The continued challenge is bridging the research "Valley of Death" i.e. moving from TRL 5 to 9 which continues to require substantial investment over a number of years. If the MOD was to adopt a longer term budget planning approach to research investment, over a 3-5 year horizon say rather than an annual cycle, this would better facilitate the potential for exploitation making the alignment of PV investment more likely and subsequently delivering an improved return on investment for both MOD and Industry – and realising true end-to-end technology management.

The exploitation of research as its technology readiness level matures is fostered by the WTC facilitating close working relationships with the MOD and industrial exploitation stakeholders in the management of the research. This close working relationship and the full integration of MOD and Industry in the research planning activities has resulted in DE&S Science Gateways rating the WTC as the top performer during the 2010 DE&S Exploitation Strength Testing



Increasing the Scope of the Weapons Technology Centre

The WTC approach has been adopted by the UK Energetics research community, which addresses energetic material research in support of the wider weapons domain portfolio and platform protection devices.

Also, the Directed Energy Weapon Special Interest Group (DEW SIG) under the Electronic Warfare (EW) Tower has recently agreed to transition to adopt the WTC approach, and other WTC scope increases are under consideration.

Although the WTC approach is aligned to key characteristics of the weapons sector, the partnering approach and methodologies we have established that we have the potential to benefit sectors across defence and security.

Summary

Over the last 3 years the WTC has realised a successful change programme delivering a partnering approach to the management of complex weapons research, and looks forward to the opportunity to improve and widen the scope in future years.

This activity has held together and widened the research community (including SMEs) in this domain. Realising adequate investment in research is a critical enabler to the success of future equipment and support procurement. Ensuring this is undertaken in a coherent and focused manner for the benefit of the UK (both MOD and industry) is essential in the current economic climate.

Across the breadth of defence and security there will be a variety of operating business models that service the needs of the sector. Therefore in addressing the question 'Can a single approach work across multiple sectors?' it is important to recognise that 'one size' does not necessarily fit all in terms of the benefits that can be delivered in adopting a WTC approach.

"The CW CDT and its coherence with Team CW offers an example of best practice in the end-to-end delivery of military capability between SIT, ECC, DE&S and Industry that could have broader application across UK Defence"

*Steve Wadey,
Managing Director,
MBDA UK
Jan 2010*

Annex A – Industrial Partners of the WTC

