UK MoD Approach to Ballistic Missile Defence

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  ■ 2010
  ■ 2015

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  ■ Statements relating to ballistic missile defence
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● Summary
SDSR 2010

- **Science and technology, paragraph 2.A.17**

- With constrained resources, and as technology advances, we must try to maintain an effective balance in our programmes and maintain flexibility to adapt to the unexpected. We will focus investment on developing capabilities and countering threats in key areas, such as autonomous systems, sensors, new materials including nanotechnology, cyber and space. We will maintain a lower level scientific overview of others to anticipate technological shocks and to spot opportunities. **We will also maintain our existing policy of close cooperation with the US and our other NATO allies on ballistic missile defences, and we intend to support proposals to expand NATO’s role.**
Dependency. We rarely deploy alone. We and our NATO Allies consciously depend on each other for particular capabilities. For example, the UK does not have its own theatre missile defence capability, while we have capabilities that are highly valued by coalition partners such as mine counter-measures vessels.
Paragraph 4.16

The UK has been under constant threat from ballistic missiles since the Second World War. But states outside the Euro-Atlantic area and non-state actors are now acquiring ballistic missile technology. The threat faced by the UK, our Overseas Territories and our military bases has evolved. We will continue to commit significant funds to the NATO Ballistic Missile Defence (BMD) network, as well as supporting research and development initiatives and multinational engagement through the UK’s Missile Defence Centre. We will invest in a ground-based BMD radar, which will enhance the coverage and effectiveness of the NATO BMD system. We will also investigate further the potential of the Type 45 Destroyers to operate in a BMD role.
Joint Force 2025 (part of SDSR 2015)

- ‘…an evolution of Future Force 2020 (FF20)’

- **Joint.** In support of our greater ambition, we will increase the depth and breadth of our ability to direct and sustain operations around the world. This means:

- …A new Ballistic Missile Defence (BMD) radar to integrate with and enhance NATO BMD…
Meeting our SDSR commitments

- **SDSR 2015** ‘We will continue to commit significant funds to the NATO Ballistic Missile Defence (BMD) network…’
  - UK contributes ~10% of overall costs (~£8M p.a.)
  - Actively participates in NATO BMD Steering Committee
    - Policy lead with expertise from the Missile Defence Centre
Meeting our SDSR commitments

- **SDSR 2015** ‘... as well as supporting research and development initiatives and multinational engagement through the **UK’s Missile Defence Centre. ...**’

- Established in 2003, unique MOD construct
  - Government-Industry *partnership*

- Part of Defence Science and Technology (DST) directorate

- Mission Statement:

  As the centre of excellence for BMD within the UK, collaborate with industry partners to provide timely scientific and technical advice on BMD, sustain national BMD expertise through underpinning S&T activities, support capability development, and develop multinational engagement with allies.
Missile Defence Centre Themes and Functions

**UK Missile Defence Centre**

- **Scenario Assessment and Wargaming**
- **Maritime TBMD Studies**
- **Lethality**
- **Sensors and C2**

**Themes and Functions**

- Systems Engineering
- Threat Characterisation
- Novel Technologies

**Supports**

- Support to Policy (MOD, FCO & Cabinet Office)
- S&T support to future capability development
- International collaboration & support to NATO
- Promote UK Industrial Opportunities and Capabilities
- Support to WMD Disablement

**MDC Budget:**

~£8M per annum
Missile Defence Centre Outputs

- Supporting R&D Initiatives…
  - Scenario Assessment and Wargaming
    - NIMBLE TITAN
    - Classified wargames
  - Lethality
    - Trials
    - Consequence of Intercept
  - Novel Technologies
    - High Altitude Pseudo-Satellite (HAPS) payload concepts

- ...and Multinational Engagement
  - US, AUS, CAN, FR, DE

- Support to US National BMD System
  - RAF Fylingdales
  - RAF Menwith Hill
Industry Support to UK BMD

- **Maritime Services:**
  - Multi-year investment in UK ARTIST Demonstrator
  - Early Warning And Control System (EWACS) Seedcorn & Commander MFR
    - Chipsets, Ambient Air Cooling, Composite Structures, Target Feature Extraction, Antenna Architectures, Stop-and-Stare Modelling
  - Multi-year investment in Modelling, Simulation, and Planning
Industry Support to UK BMD

- Development of Sea Viper BMD capability since 2008
  - Collaborating with MBDA (Fr) to gain some access to new missile models to support modelling of Sea Viper against ASBM
  - Explored algorithms to evolve an Integrated Air and Missile Defence (IAMD) capability for Sea Viper

- Collaboration across UK, FR, DE & IT since 2014 to explore future BMD Interceptor
  - Defeat future high-end air threats
  - Enhance affordability
  - Exploit disruptive missile technologies
Industry Support to UK BMD

- 3-year collaborative PV funded research activity to explore Sea Viper-based ASBMD (Anti-ship Ballistic Missile Defence) capability
  - Determine Aster Blk1NT performance envelope
  - Understand architecture issues
Industry Support to UK BMD

- Lethality modelling and simulation
  - Development of fast-running engineering models to assess BMD intercepts and Consequence of Intercept (COI) exploiting data from years of research into high-velocity impacts

- Provision of MDC dedicated facility in support of S&T delivery since Apr-15
  - Demonstrates QinetiQ’s commitment to the MDC

- Novel technology
  - Exploiting high-energy laser technologies and facilities to inform studies into potential applications for the future of BMD
Industry Support to UK BMD

○ Target Oriented Tracking System Command and Control Environment (TOTS CCE)
  ■ Enables modeling and assessment of BMD-related scenarios in a multi-environment battlespace

○ Support to MDC Research and Analysis
  ■ Leverage of L3 ASA software during MDC trials and analysis

○ PV developed code exploited during At Sea Demonstration 2015 (ASD15) – processing and integration of third-party data
Meeting our SDSR commitments

- SDSR 2015 ‘We will invest in a ground-based BMD radar, which will enhance the coverage and effectiveness of the NATO BMD system.’
  - Air Command (Air Capability) lead
  - Funded programme
  - Concept phase commenced April 2017
  - In service as part of JOINT FORCE 2025
  - Upper tier capability
  - Inherent space situational awareness capability will be exploited
Meeting our SDSR commitments

- **SDSR 2015** ‘We will also *investigate further the potential of the Type 45 Destroyers to operate in a BMD role.*’

- **Type 45 Destroyer (T45)**
  - Navy Command (Maritime Capability) lead
  - Investigating potential of Sea Viper to conduct maritime theatre BMD operations
Type 45 Destroyer S&T Programmes

- Type 45 Science & Technology (TSAT)
  - Sept 2013
  - Observed US Flight Test Operational 01
  - Successfully tracked two Medium Range BM targets

- Type 45 Experimental Concurrency & Cueing (TECC)
  - Oct 2015
  - During Maritime Theatre Missile Defence Forum (MTMD-F) ASD15
  - Successfully tracked a BM target whilst concurrently maintaining a full air picture
  - Provides even more confidence in the T45’s potential

- What next?
  - Experimental Maritime Interoperability Test-bed (EMIT)
    - Real-time data exchange
    - Considering broader maritime applications
Summary

- We will continue to commit significant funds to the NATO Ballistic Missile Defence (BMD) network, as well as supporting research and development initiatives and multinational engagement through the UK’s Missile Defence Centre. We will invest in a ground-based BMD radar, which will enhance the coverage and effectiveness of the NATO BMD system. We will also investigate further the potential of the Type 45 Destroyers to operate in a BMD role.

- UK Missile Defence Centre
  - Government-Industry *partnership*
  - Proven record of raising awareness of BMD issues across government
Thank you for listening

Questions?