

# Radiological and Nuclear Security Portfolio

October 2022



Radiological &  
Nuclear Unit



Home Office

**Home Secretary**  
and ministerial team

**Permanent Secretary**

Science, Technology, Analysis, Research and Strategy (STARS)

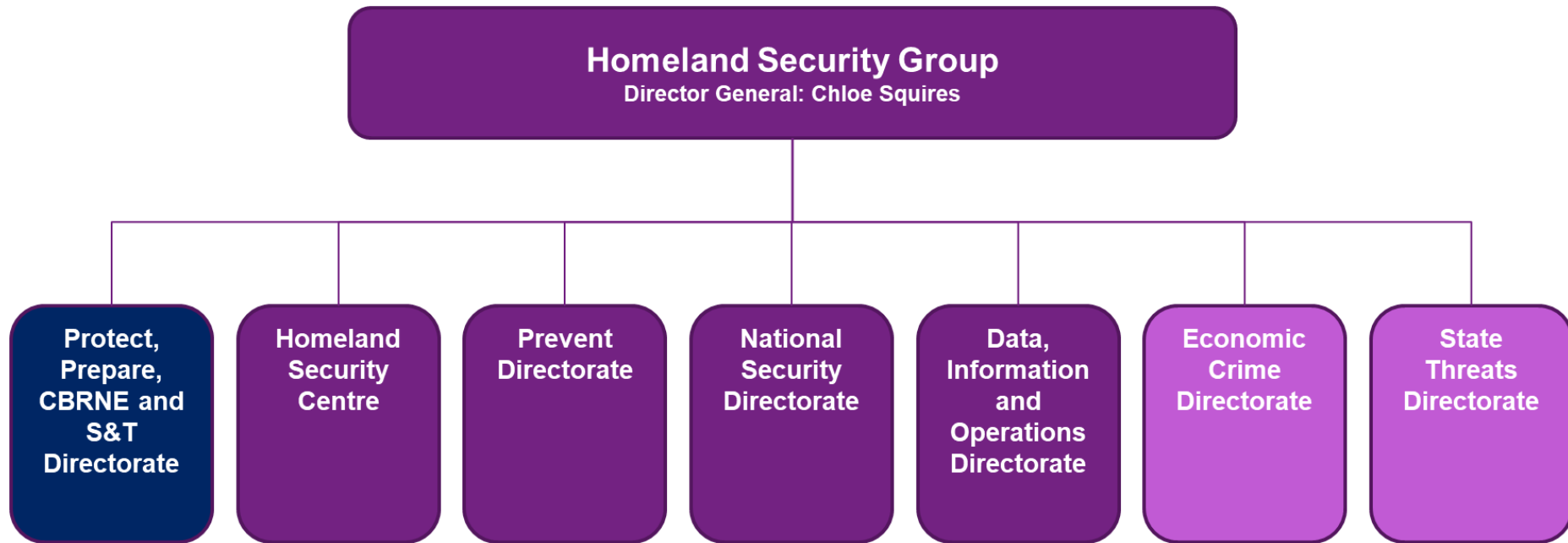
**Homeland  
Security  
Group**

**Public  
Safety  
Group**

**Migration  
and Border  
Group**

Cross-cutting enablers (e.g. legal, commercial) including **Borders and Enforcement**

- A new group responsible for National Security Issues



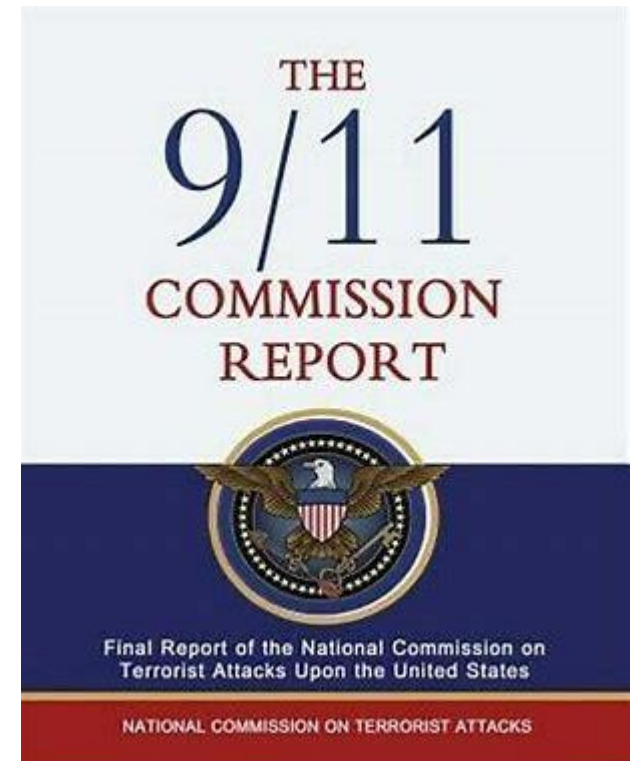
- The Home Office is responsible for some very low-likelihood, very high-impact risks

Risk Scenario Title	Risk ID
Terrorist attack of global strategic importance overseas	R1-FCO
Conventional attack on chemicals infrastructure	R2-BEIS
Attack on UK gas infrastructure – conventional or cyber	R3-BEIS
Attack on UK electricity infrastructure – conventional or cyber	R4-BEIS
Conventional attack on government	R5-CO
Malicious attack on fuel supply infrastructure	R6-BEIS
Malicious attack on civil nuclear installation	R7-BEIS
Contamination of the food chain - chemical	R8-FSA
Chemical attack on water supply infrastructure	R9-Defra
Malicious aviation incident	R10-DfT
Malicious maritime incident	R11-DfT
Malicious rail network incident	R12-DfT
Anthrax letters	R13-HO
Biological attack – unenclosed urban area	R14-HO
Malicious attack leading to building collapse	R15-HO
Person-borne improvised explosive device	R16-HO
Chemical attack – enclosed urban area	R17-HO
High profile assassination	R18-HO
Marauding terrorist attack	R19-HO
Nuclear attack – unenclosed urban area	R20-HO
Radiological attack – unenclosed urban area	R21-HO
Strategic hostage taking	R22-HO
Chemical attack – unenclosed urban area	R23-HO
Escalation of Northern Ireland related terrorism	R24-NIO
Cyber attack – government critical systems loss	R25-CO

Cyber attack – government data breach	R26-CO
Malicious cyber incident – transport	R27-DfT
Cyber attack – health and social care system	R28-DHSC
Cyber attack – SWIFT financial messaging system	R29-HMT
Cyber attack – telecommunications systems	R30-DCMS
Significant increase in identified cases of child sexual abuse and exploitation and exploitation	R32-HO
Significant increase in the availability/use of Class A drugs	R33-HO
Corruption and bribery	R34-HO
High profile cyber-crime incident	R35-HO
Increase in the availability and use of illegal firearms and ammunition	R36-HO
Increase in modern slavery and human trafficking	R37-HO
Significant increase in money laundering of criminal proceeds through the UK	R38-HO
Increase in non-fiscal fraud and market abuse against the UK	R39-HO
Organised immigration crime	R40-HO
Fraud against the Exchequer	R41-HMRC

- History Tells us that low-likelihood risks do materialise

*“Across the Government, there were failures of imagination, policy, capabilities and management... **the most important failure was one of imagination.**”*



Risk

- A terrorist attack using an **improvised nuclear device** could have catastrophic consequences: **tens of thousands of lives lost, over a trillion pounds of direct and indirect economic costs** and long-lasting health, environmental and societal impact felt on an international scale.
- An attack using a **radiological dispersal device** would be less consequential but still cause billions of pounds of direct and indirect economic costs (National Security Risk Assessment 2019).
- JTAC assesses that there is a **remote chance** that terrorists will conduct a nuclear attack plot within the UK in the next year and that an attack using a radiological device is **highly unlikely** ; but that the nature of the threat is such that **assessments may change with little warning** due to fluctuating terrorist intent (JOSP/070/21)
- HMG Integrated Review of Security, Defence, Development and Foreign Policy 2021: “Terrorism will remain a major threat over the coming decade, with a more diverse range of material and political causes, new sources of radicalisation and evolving tactics... **It is likely that a terrorist group will launch a successful CBRN attack by 2030**”

Response

**Protect**

To strengthen our protection against a terrorist attack

**Pursue**

To stop terrorist attacks

**Prepare**

To mitigate the impact of a terrorist attack

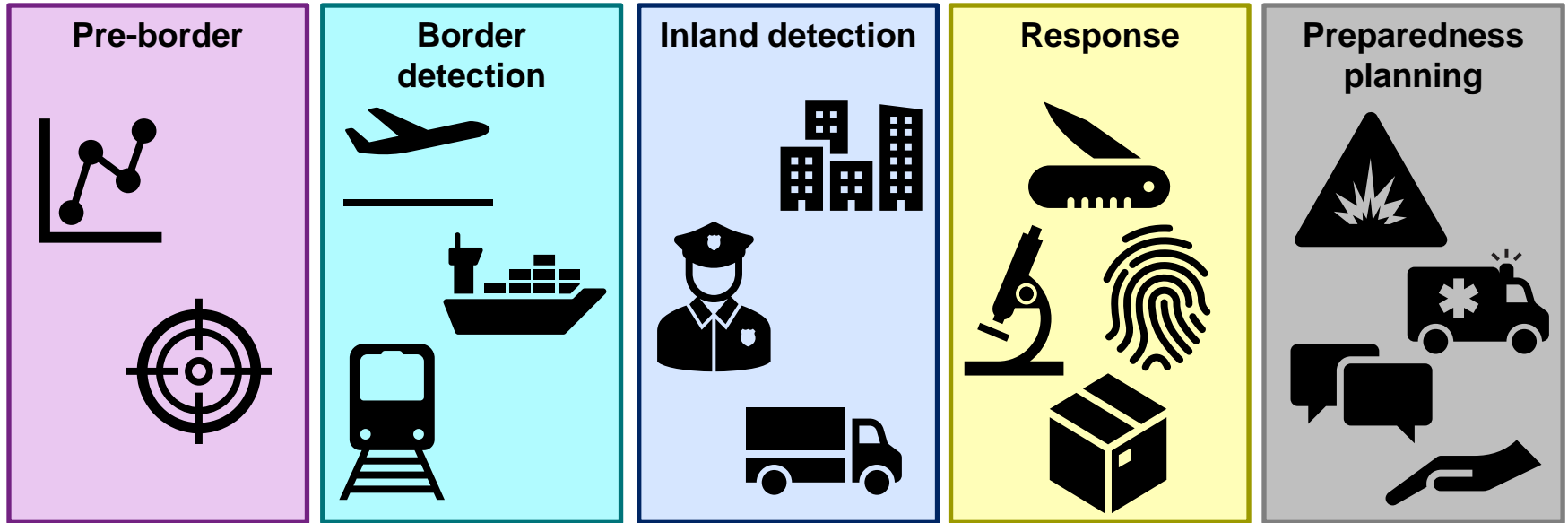


## Portfolio Vision

*The RN Security Portfolio will **deliver an enhanced and more efficient end-to-end system to better protect the public from the risk of a catastrophic nuclear or radiological terrorist attack.***

*To achieve this we will research, develop, deploy and maintain advanced capabilities, incorporating cutting-edge technology, spanning detection and deterrence to preparedness planning and the safe disposal of RN materials.*

- The portfolio is scoped to cover the end-to-end system for RN security



Policy & Strategy

Research & Development

Testing & Assurance

International Collaboration





Strengthen our defences at the **Border.**

We will strengthen our primary defence to detect the attempted smuggling of RN threat materials or devices into the UK.

Examples of Portfolio deliverables include:

- Upgrade portal electronics
- Extend detection coverage to new locations
- Introduction of Enhanced Detection System (EDS)



Refresh and enhance police **Inland** detection.

We will build up our ability to conduct detection at major and public events plus the capability to support active investigations.

Examples of Portfolio deliverables include:

- Develop, with CT police the mobile detection capability
- Procure a next generation vehicle mounted capability



Evolve our X-HMG **Emergency Response** system.

We will evolve, join up and strengthen our system of resilience were an attack to be identified or to occur in the UK.

Examples of Portfolio deliverables include:

- Evolve cross-HMG systems response to detecting materials
- Evolve forensics to aid prosecutions
- Develop the X-HMG plan for incident response



Put **Research & Development** at the heart of everything we do.

We will put leading edge, technically assured capabilities into the hands of our operational partners.

Examples of Portfolio deliverables include:

- Create a system for ensuring capabilities meet operational needs
- Establish capability to technically assure planned capabilities
- Provide technical advice to the Portfolio

# Research & Development

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## IN MORE DETAIL – 4 OBJECTIVES

### 1. Ensure all operational capabilities have the appropriate level of assurance

- Vendor/partner evidence review
- Test and evaluation (like Sentinel)
- Full system modelling
- Definition of the evaluation process



## 2. Understand the UK technical capability gaps

- Outline specific detector system vulnerabilities/operating envelope (from 1)
- Understanding the radiometric requirement along interdiction pathways (on paths with no capability)
- Capability requirements/options for a high threat 'surge' type scenario
- Translating operational partner goals into technical requirements/capability statements

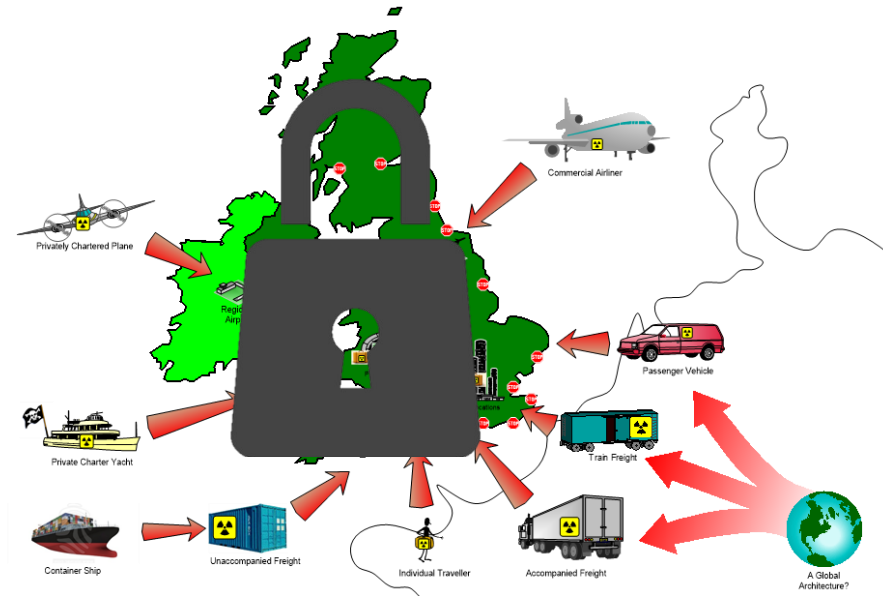


Border Force x-ray scanner – what additional capability could we get if we used this for fission signature detection?

### 3. Deliver/investigate system enhancements and gap closing

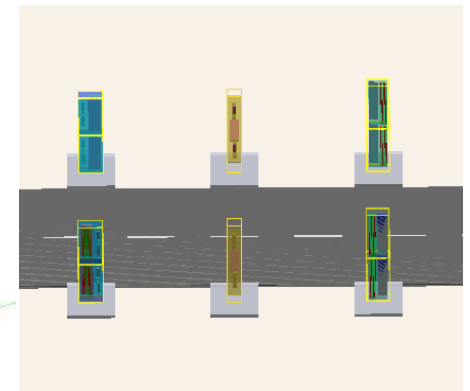
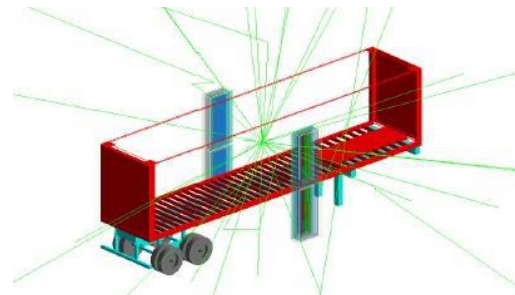
- Understanding the current state of the art
- Driving innovation into the market
- Utilising the understanding from 2 to build options to deliver enhancements and close capability gaps through new equipment/processes
- Develop concepts to leverage enhanced data analytics for improved performance/efficiency
- System optimisation

Flow of commerce into and around the UK –  
How do we introduce capability to make this  
secure?



## 4. Maintain an expert capability to deliver the other 3 asks

- Maintain capability in
  - Modelling
  - Experimental techniques
  - Data assessment
- Conduct academic outreach
- Work closely with international partners
- Maintain understanding of the operational environments
  - Cargo distributions
  - Background radiation



Right - Examples of radiation transport modelling conducted by AWE