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Environment, Safety & Security Director

# Agenda

- Introduction to Sellafield Ltd
- Regulatory Environment
- Balancing environment, safety and security
- Security enhancement programme
- Outline governance structure
- Risk
- Assurance
- The 'Green Book'
- £££
- Business Case reflections

# Sellafield site in West Cumbria



# Our history

## We have over 70 years of history and experience



1940s

### Munitions:

At Sellafield, TNT was made and munitions shells filled.

### Nuclear deterrent:

The remote nature of the site, along with its industrial workforce and experience in working for the Ministry of Supply, makes it the ideal location to produce plutonium for the country's atomic weapons programme.



1950s

1960s

### Reactor construction and operation:

The United Kingdom Atomic Energy Authority is formed. The world's first commercial nuclear power station, Calder Hall, and the Windscale Advanced Gas-cooled Reactor are developed – both are forerunners of a fleet of nuclear power stations across the country.



1970s

### Commercial reprocessing:

Plans are developed to commercialise reprocessing at Sellafield. The site also comes under the ownership of British Nuclear Fuels Ltd. The United Kingdom Atomic Energy Authority retains ownership of the Windscale site.



1980s

1990s

### Waste management:

Construction commences on a new facility called the Thermal Oxide Reprocessing Plant (Thorp). The site is now the only nuclear site in the country that can safely manage all three forms of radioactive waste: low, intermediate and high.



2000s

### Multiple missions:

Thorp and Magnox are established as key international players in the fuel cycle, and reprocessing helps meet the requirements of domestic power generation and overseas customers. First generation reactor decommissioning gets underway, and preparation for wider decommissioning activities starts. Ownership of the site moves to the newly-created Nuclear Decommissioning Authority. Sellafield Ltd becomes the nuclear site licensee.



2010s

### Risk and hazard reduction:

Access to the waste and fuel stored in our sixty-year-old fuels storage ponds and waste silos starts, retrieving it and moving it to modern storage. In 2016 Sellafield Ltd becomes a subsidiary of the NDA.

### Legacy:

Redundant munitions structures and facilities buried underneath the site.

### Legacy:

First generation reactors requiring decommissioning.

### Legacy:

High level nuclear waste requiring treatment, storage and, in the case of foreign owned waste, shipment back to the country of origin.

### Legacy:

Pilot plants, Thorp and Magnox reprocessing facilities requiring decommissioning.

### Legacy:

Aged pond and silo facilities remain with no waste removal capability. Investment in the assets is required to enable decommissioning.

### Legacy:

Pond and silo waste storage facilities with large inventories, which do not meet modern standards.

# Thinking differently about clean-up



Safe, Secure Site Stewardship



Demonstrable Progress



Return on Investment



# Complex Regulatory Environment

- Nuclear Installations Act 1965, Nuclear Site licence condition 11 – Emergency arrangements.
- Nuclear Security Industries Regulations 2003
- Radiation (Emergency Preparedness & Public information) Regulations 2001
- Control of Major Accident Hazard (COMAH) Regulations 1999.
- Carriage of Dangerous Goods Act.
- Fire Services Act 2001.
- Managed in a complex and hazard site environment, challenges of practicality.

# Nuclear Site Security Plan

The Office for Nuclear Regulation (ONR) has adopted security Assessment Principles (SyAPs). The move to SyAPs allows a much more **outcome focused approach** where high level goals are laid out, and the means by which these are met are developed and justified in detail by Sellafield Ltd as the dutyholder. For a large, complex site such as Sellafield with a wide range of materials, hazards and technologies, this change to an outcome focused approach for security presents a significant **opportunity to articulate and demonstrate proportionate, integrated and effective security** arrangements.

The overall NSSP is about more than defining and demonstrating security. The NSSP establishes the primacy of the dutyholder and, with the SyAPs, provides the basis for underpinning a comprehensive, interdependent and robust security management system. The strong starting point further enables the development of a regulatory relationship firmly **based on proportionate and risk informed security outcomes.**

# Our approach to the Environment, Safety & Security

- Integrated approach
- Based upon 'Risk Informed' decision making
- Balancing the nuclear & radiological risk with the security risk and protecting the environment
- Unified Command, Control & Communications (C3) Response Model
- Safety and security based upon 'Defence-in-Depth' & 'Graded Approach'





# Sellafield Security Enhancement Plan (SSEP)

The SSEP was initiated in 2011. A £880m investment in security delivered over a number of years, concluding in 2020

Replacing and upgrading existing ageing PPS assets

Created new PPS capabilities, Intermediate (HSA) and inner Areas  
Created new Command & Control digitised Hub

Established new operational and response capabilities, CNC and Guard Force

Introduced an integrated Cyber Security Operations Centre (CSOC)

Enhanced the operational and operational support capacity to create an enduring capability

# Main Site Command Facility (MSCF)

***MSCF: “The resilient, digitised hub for Sellafield’s unified Security and Resilience Operations, Emergency Response and Recovery”.***



- High performance computing, software, alarms and sensor feeds protected by cyber security provide the platform for the management of daily operations, incidents and emergencies
- It will be a digitised headquarters enabling a Common Operating Picture (COP), giving a joint understanding of risk, shared situational awareness and timely decision making
- Establishing the MSCF is a national priority

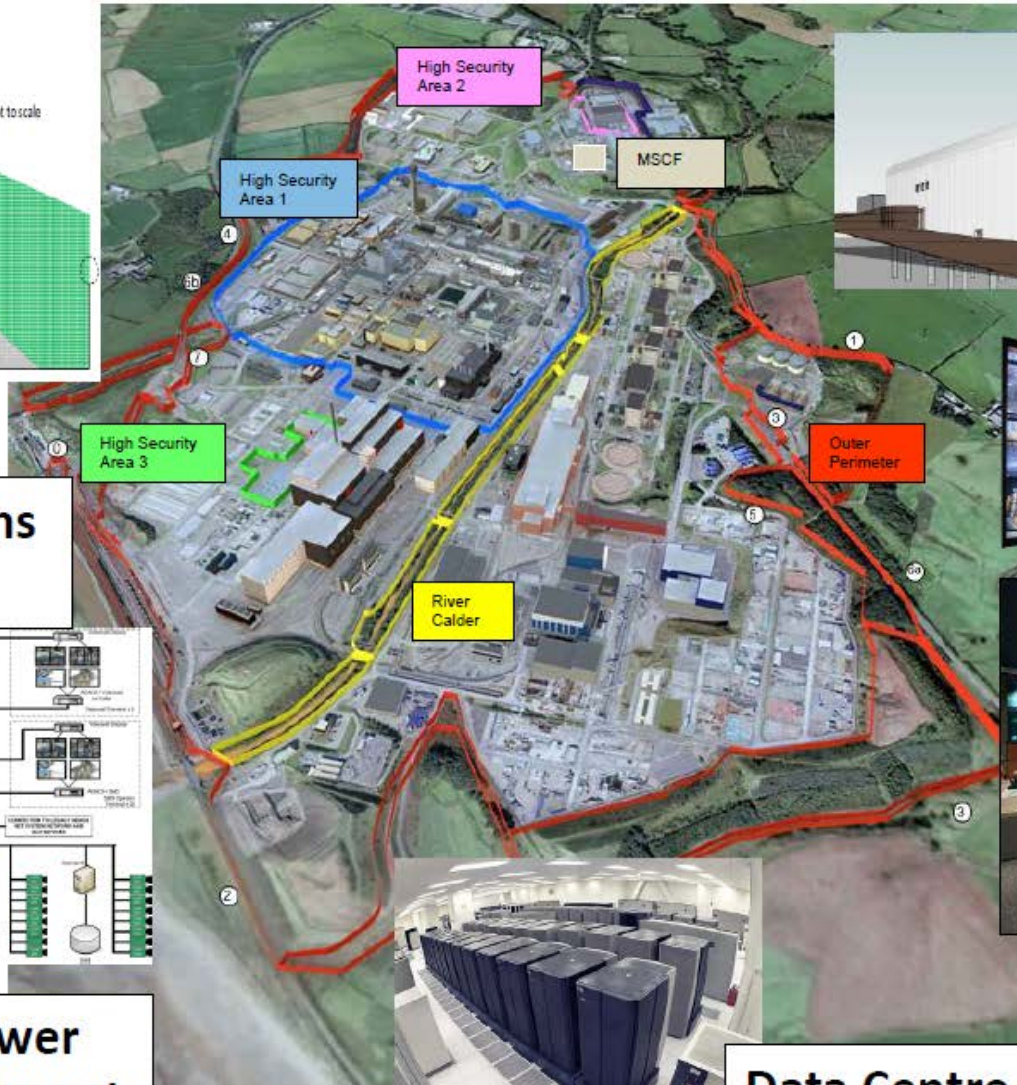
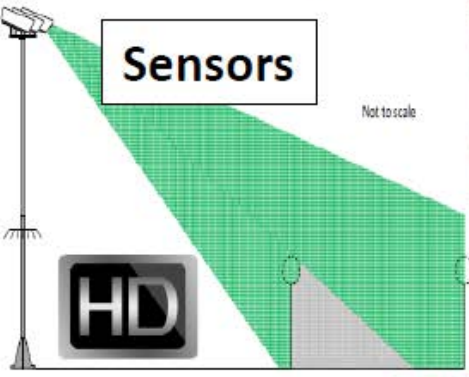
# Unified Command & Control (UC&C)

Primary Elements of the programme

1. Deter, Detect and Delay
2. Main Site Command Facility and Sellafield Site Architecture Upgrade
3. Cyber
4. The people!!



# Scope of UC&C



**MSCF**

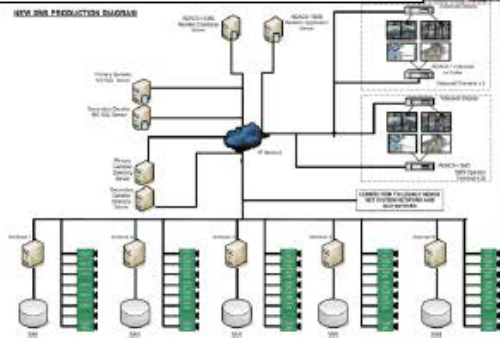


**Security / Emergency Management Systems (SMS / EMS)**



**Command and Control suite**

**Communications Network**



**Power Network**



**Data Centre**

# Security capability examples



Civil Nuclear Constabulary



Hostile Vehicle Mitigation



Vehicle Access Control Point



Civilian Guard Force



Unmanned Aerial Vehicles (UAVs)



Subterranean voids



Specialist trained dogs



Cyber Security Operations Centre



Ballistically protected vehicles



Emergency Duty Teams

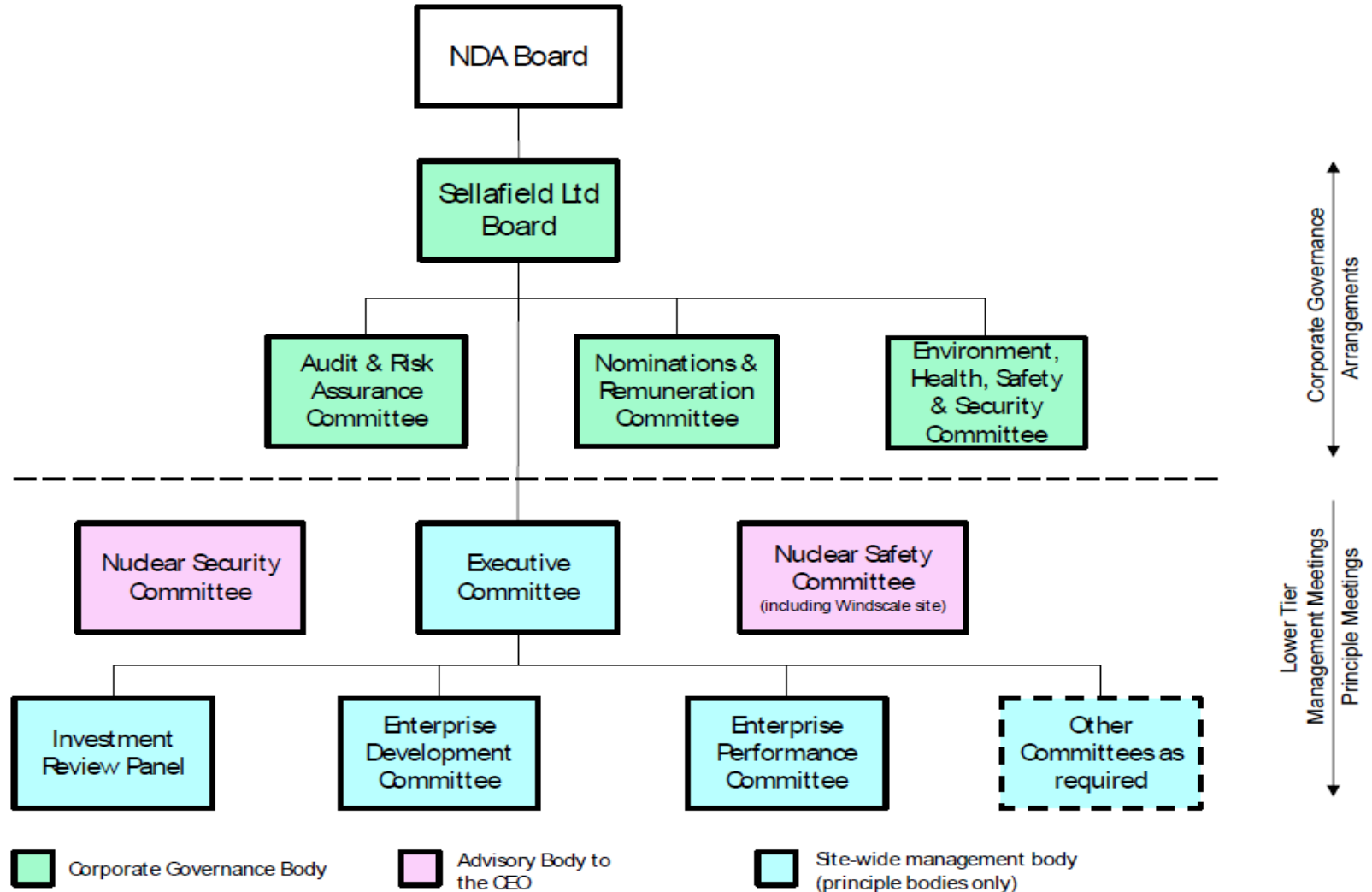


Sellafield Fire & Rescue Services



Security vetting and access control

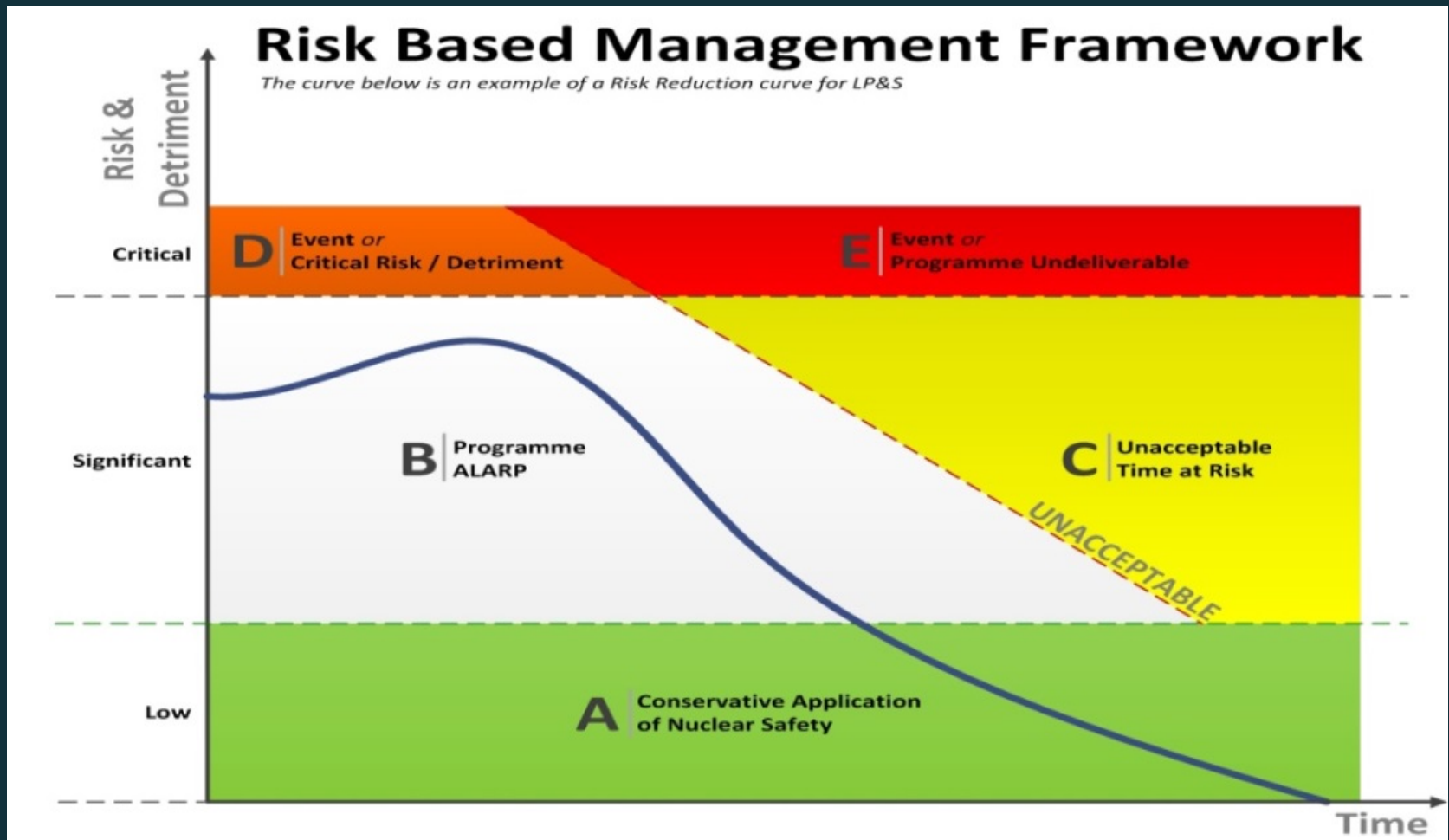
# Governance



# Corporate Risk Methodology

- Quantitative risk
  - Active Risk Management tools
  - Effective at a tactical, operational and project level
- Subjective risk
  - Strategic / Corporate risk is more subjective and therefore needs a different approach
  - Informed by quantitative risk
  - Contextualising the risk against a diverse range of risks
  - Balancing the totality of the risk, the legacy risk (hazard) against safety and security case risks, DBT, beyond DBT and Extreme events.

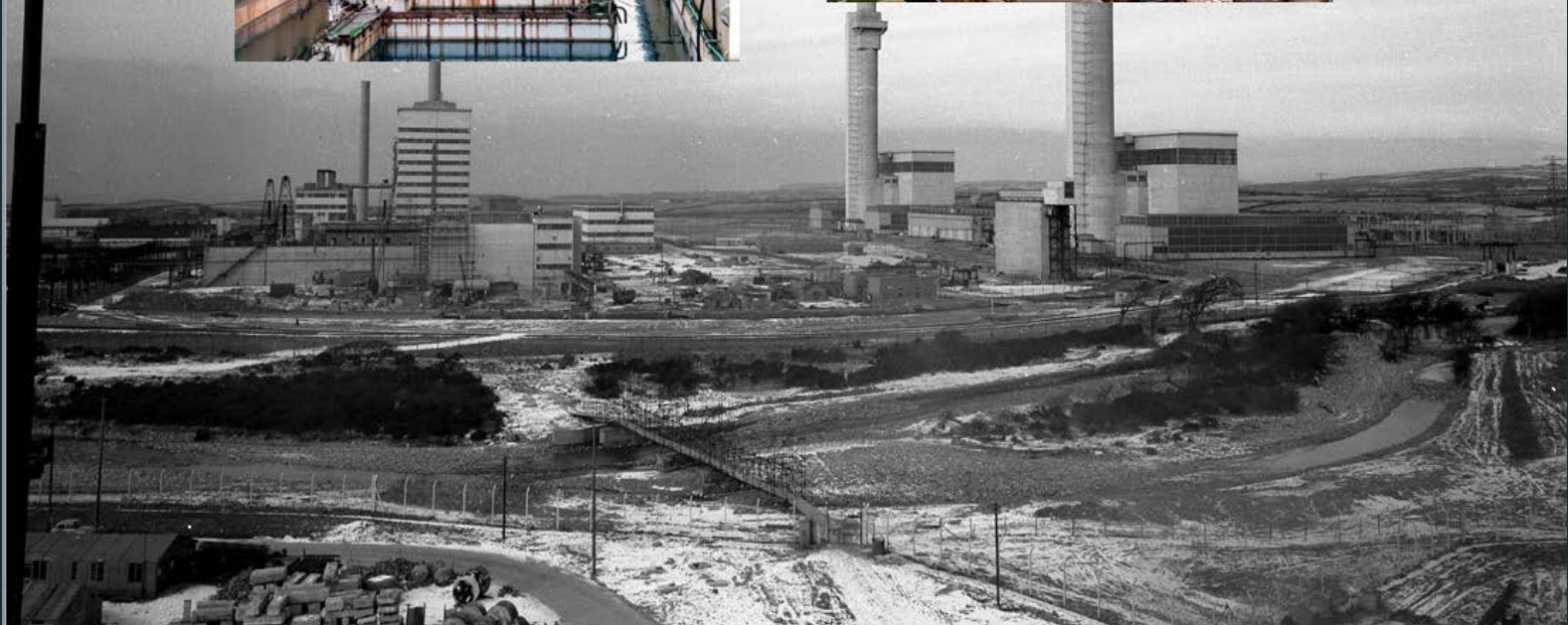
# Sellafield Ltd risk management framework





# The security challenge – Balancing intolerable risk

Our Greatest challenges is the legacy plants



# ES&S VMOST (draft)

## Mission

- ES&S will enable efficient delivery of the **Sellafield Ltd Corporate Plan** and **maximise environmental benefit** by :
  - **Providing direction and capability** to support fit for purpose operations through an proportionate approach to risk.
  - **Drive continuous improvement** and integration where possible against safety, security and environmental standards applied across the business, and with our supply chain partners, through sharing good practice and robust assurance.
  - **Inform and influence key stakeholders** to leverage support for accelerated safe, secure environmental remediation.
  - **Deliver**, in conjunction with Site Management and Value Streams , safe, secure site stewardship.

# Assurance framework

## Security & Resilience Strategic Objectives

Key to Colour Coding:		4 - Improvement Required	3 - At Risk	2 - Fit for Purpose	1 - Best Practice	N/A - No Assessment Req'd	Jan-19
Strategic Objective	RAC	FOOTPRINT				Comments	
<b>SO 1</b> Fully integrate and rehearse preparedness and response arrangements	2					A good example of external benchmarking of the achievement of SO1 as GREEN would be evidenced by the 2018/19 Level 1 (ONR-ONS AMMAAD) Security Exercise for the Site on Wednesday 14th November 2018; ONR AMMAAD "a very strong GREEN" performance which ONR described as "Industry-leading". This strong performance demonstrated the continued programme that has been made since the 17/10 Security Exercise which was also a robust GREEN illustrated in 2018/19 through inclusion of integrated cyber exercising. All ONR AMMAAD Level 1 security exercises in 2017/18 or 2018/19 were AMMAAD as GREEN.  Completion rate of S&R led emergency exercises conducted at facility level in 2018/19 are currently at a GREEN level.  Elements of best practice identified in SL relationships with external agencies to support an enhanced integrated response and recovery capability.	
<b>SO2</b> Enable a secure and resilient site	2					In 2018/19 the assurance relationship has been maintained. This objective will however remain at risk until the GERP Portfolio has delivered its entry. Response plan associated with this is in place but remains subject to an update prior to finalisation.  The CDTs are fully manned and trained. 24/7 Cyber Security Operating Centre capability is in place. Ongoing delivery of Cyber Project Improvements to enhance protection / detection and response capability. Three live Regulatory (ARMA) exercising and maintenance of emergency equipment. Action plans are in place to address however the human affect ability to react and in practice with Resilience capability demonstrated during the response to the Nitic Acid spill at the Inactive Tank Farm 10th Jan 19.	
<b>SO3</b> Deliver and embed the security, emergency management and resilience portfolio (SibE*)	3					Overall project delivery and operational capability realisation largely remains within the acceptable tolerance range agreed with stakeholders and regulators. In Site Resilience and Emergency Enhancement Programme capability demonstrations have been successfully completed for all 3 capabilities for delivery this FY. Delivery of Initial Operating Capability within the Main Site Command Facility remains a challenging. Delivery in delivery has continued through the quarter and recovery plans have been put in place.	
<b>SO4</b> Integrate security and resilience into Sitefield Ltd core business, and act as an enabler	3					Ability to demonstrate investment value AMMAAD as fit for purpose, given improved ability to forecast and AMMAAD investment through OUGS. Forecasting to meet financial targets at year end. Ability to meet future financial reduction will be challenging.  Provide functional integration across Site as per At Risk. However, an implementation plan to deliver Assurance to Partnership with the business is in delivery, and is being reported against through governance. An example of progress would be over 92% off ability Security Shells (SSG) have been allowed approval in partnership from S&R/DS&S to the business O&M.  Deliver integrated support to hazard reduction operations and Project as per At Risk. This is being AMMAAD and monitored, however direct levels of support are expected to increase substantially until after NSCF IOC. High Security Area 1 arrangements successfully implemented within the business with little impact to operations. PPP will require and receive increased resources given its importance. Work is continuing on development of CS&A requirements for Secure by Design and confirmation of external risk (Rad Teaming).	
<b>SO5</b> Refine the directorate, with an effective assurance model	3					Overall improving trend against this objective in the last quarter with significant improvements made. All strategies and plans in place and fit for purpose with the new Symp aligned NSGP forecasts for approval by ONR in February. New assurance framework in place across the Directorate supporting enhanced performance monitoring. Closure of the NIO later of concern align at security AMMAAD as also anticipated in February. Overall stakeholder management working well in practice with stakeholder review a positive update to the Directorate communication plan is ongoing.	

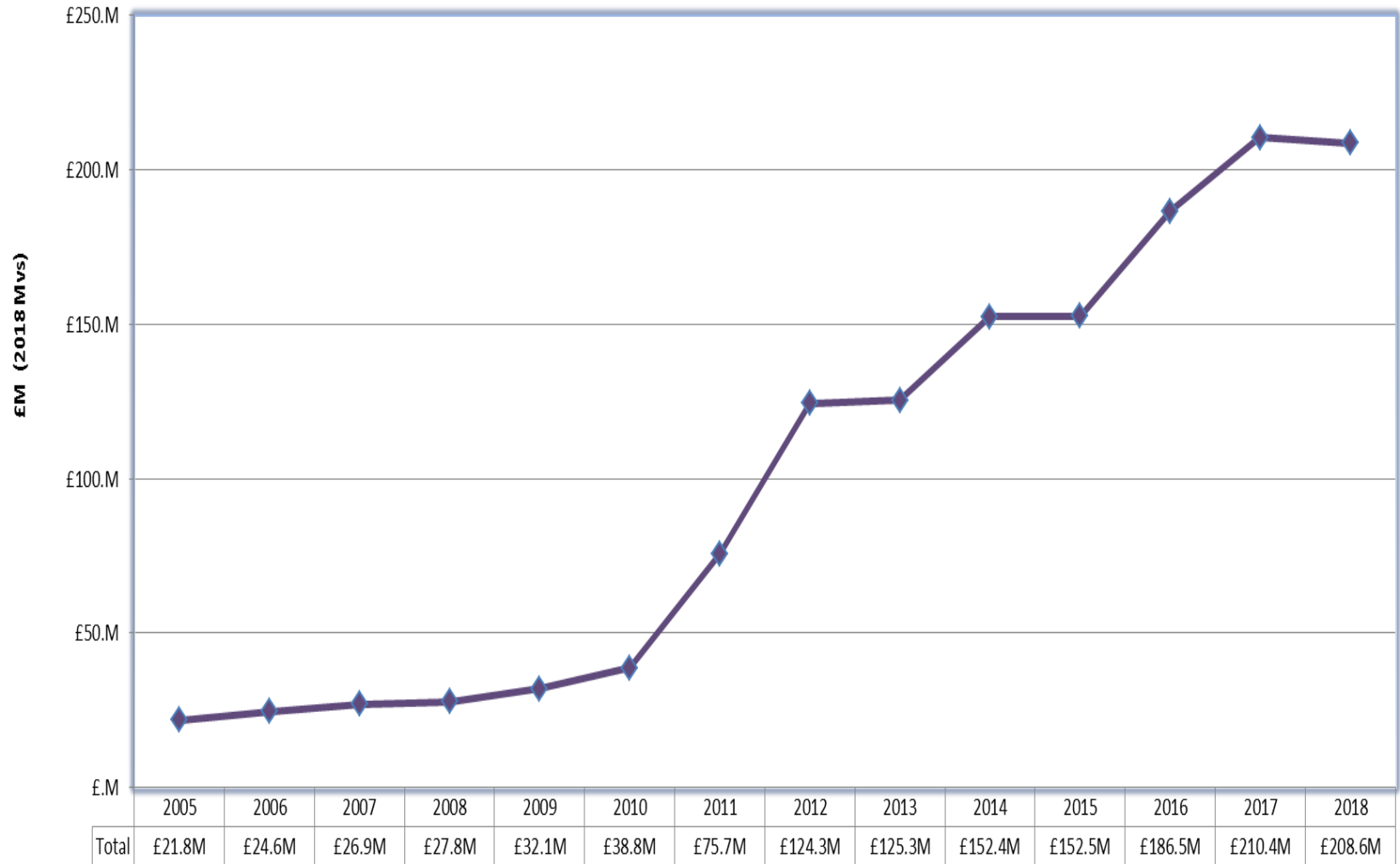
# Modelling – AVERT



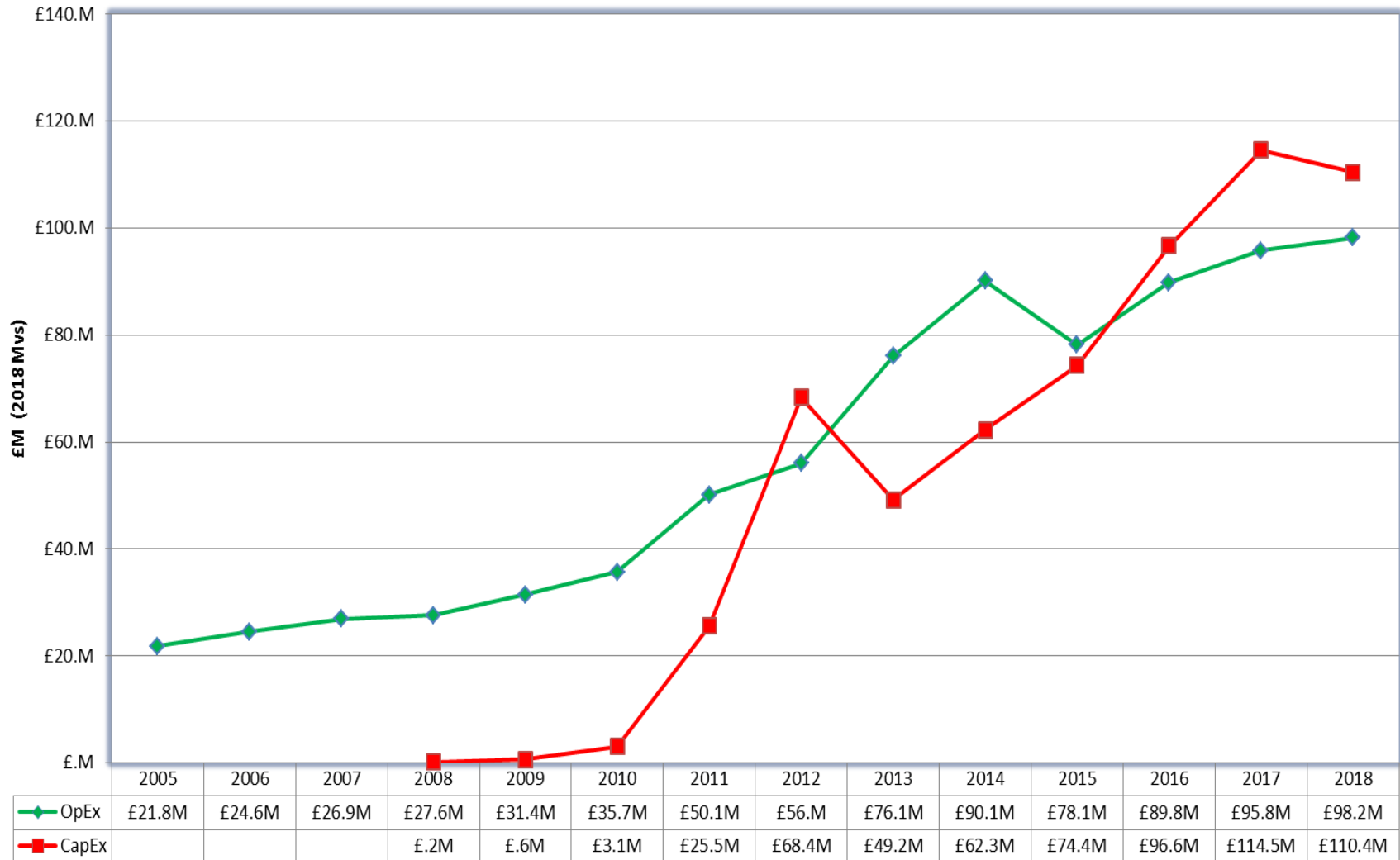
# Governance – Green Book business case

<b>Strategic dimension</b>	<b>What is the case for change, including the rationale for intervention?</b> What is the current situation? What is to be done? What outcomes are expected? How do these fit with wider government policies and objectives?
<b>Economic dimension</b>	<b>What is the net value to society (the social value) of the intervention compared to continuing with Business As Usual?</b> What are the risks and their costs, and how are they best managed? Which option reflects the optimal net value to society?
<b>Commercial dimension</b>	<b>Can a realistic and credible commercial deal be struck?</b> Who will manage which risks?
<b>Financial dimension</b>	<b>What is the impact of the proposal on the public sector budget in terms of the total cost of both capital and revenue?</b>
<b>Management dimension</b>	<b>Are there realistic and robust delivery plans?</b> How can the proposal be delivered?

# Sellafield Total Security Costs (2005-2018)

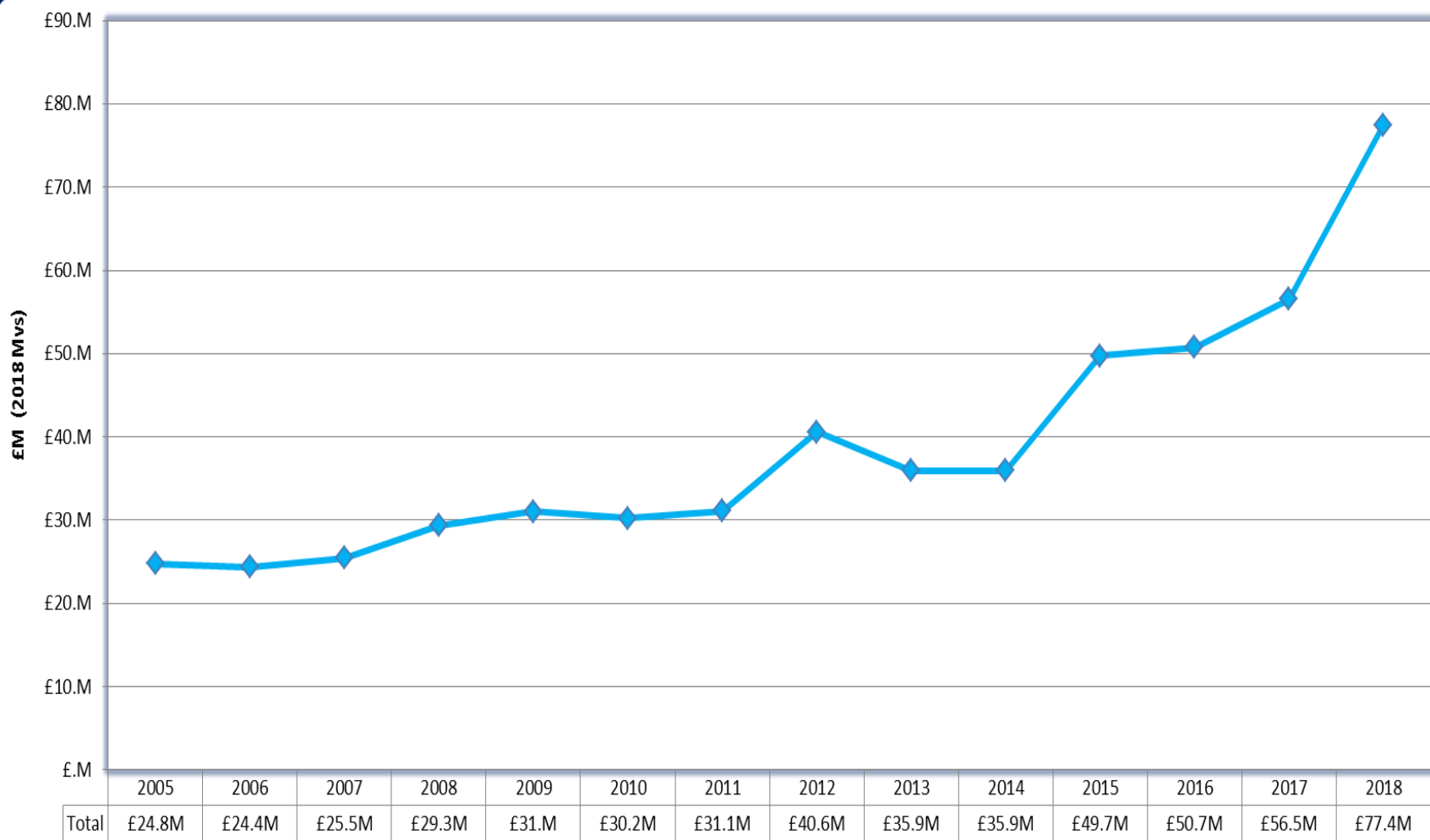


# Security Operational / Capital Costs (2005-2018)



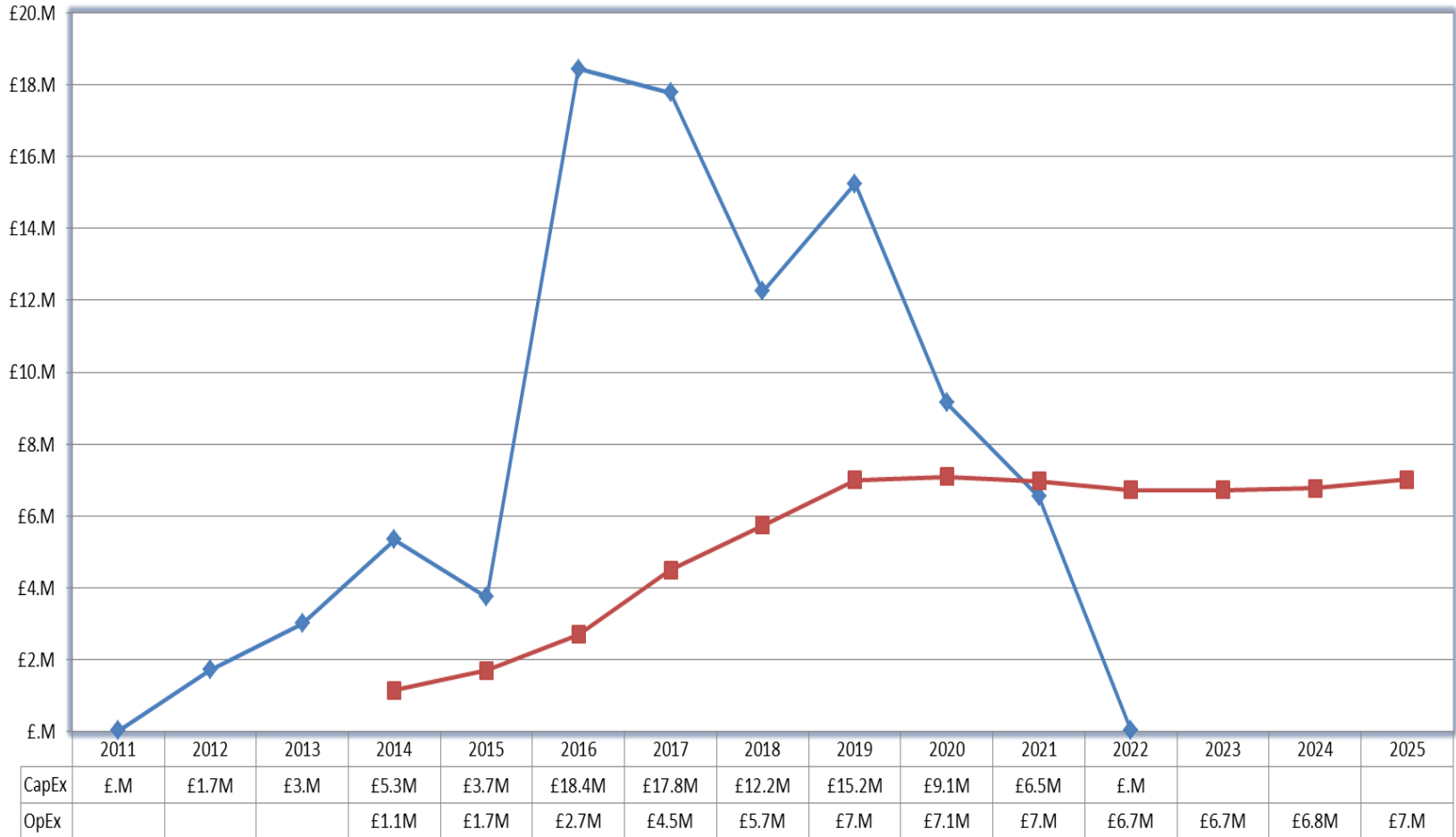
# ICT Costs (2005-2018)

Information Services Organisation Only

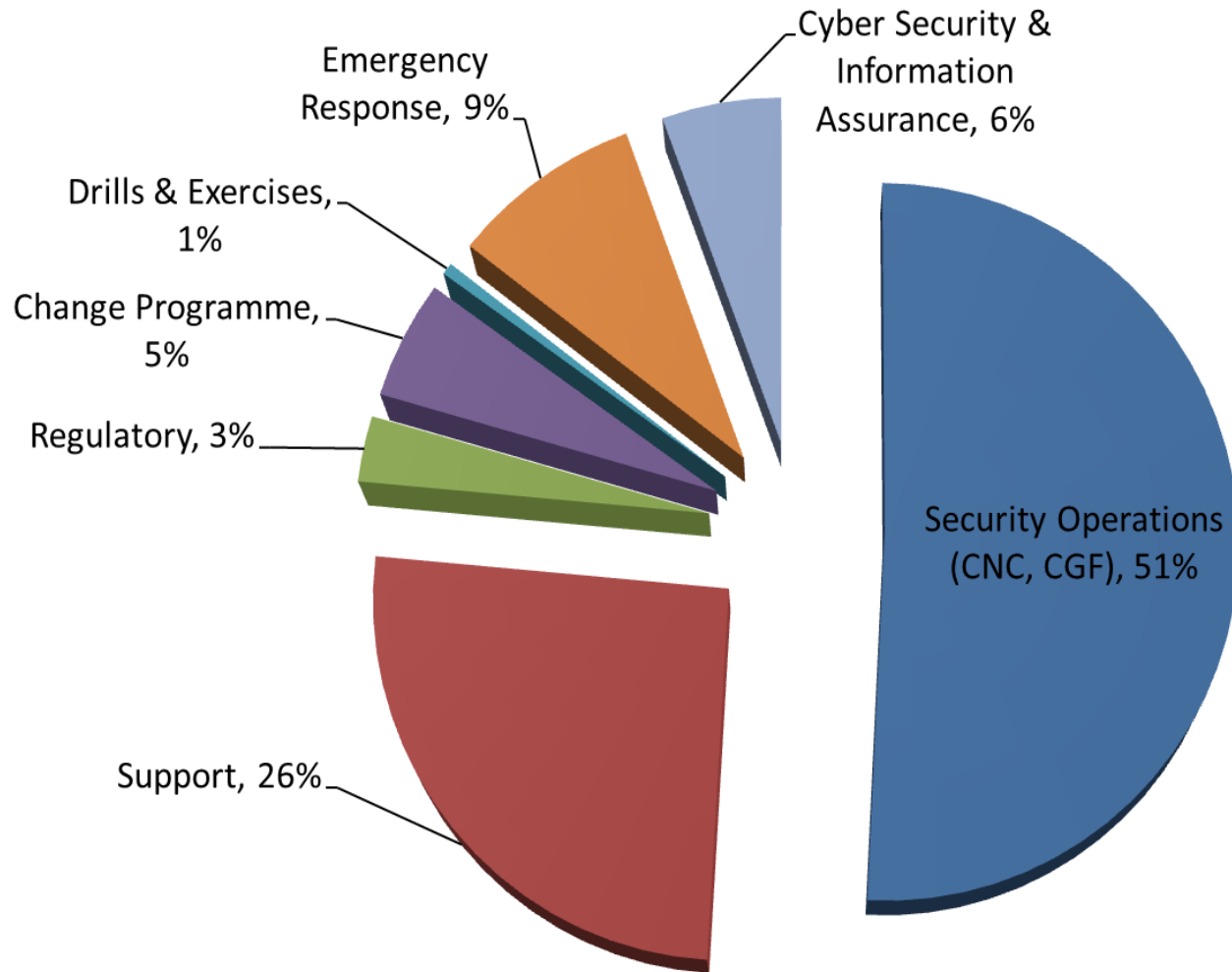




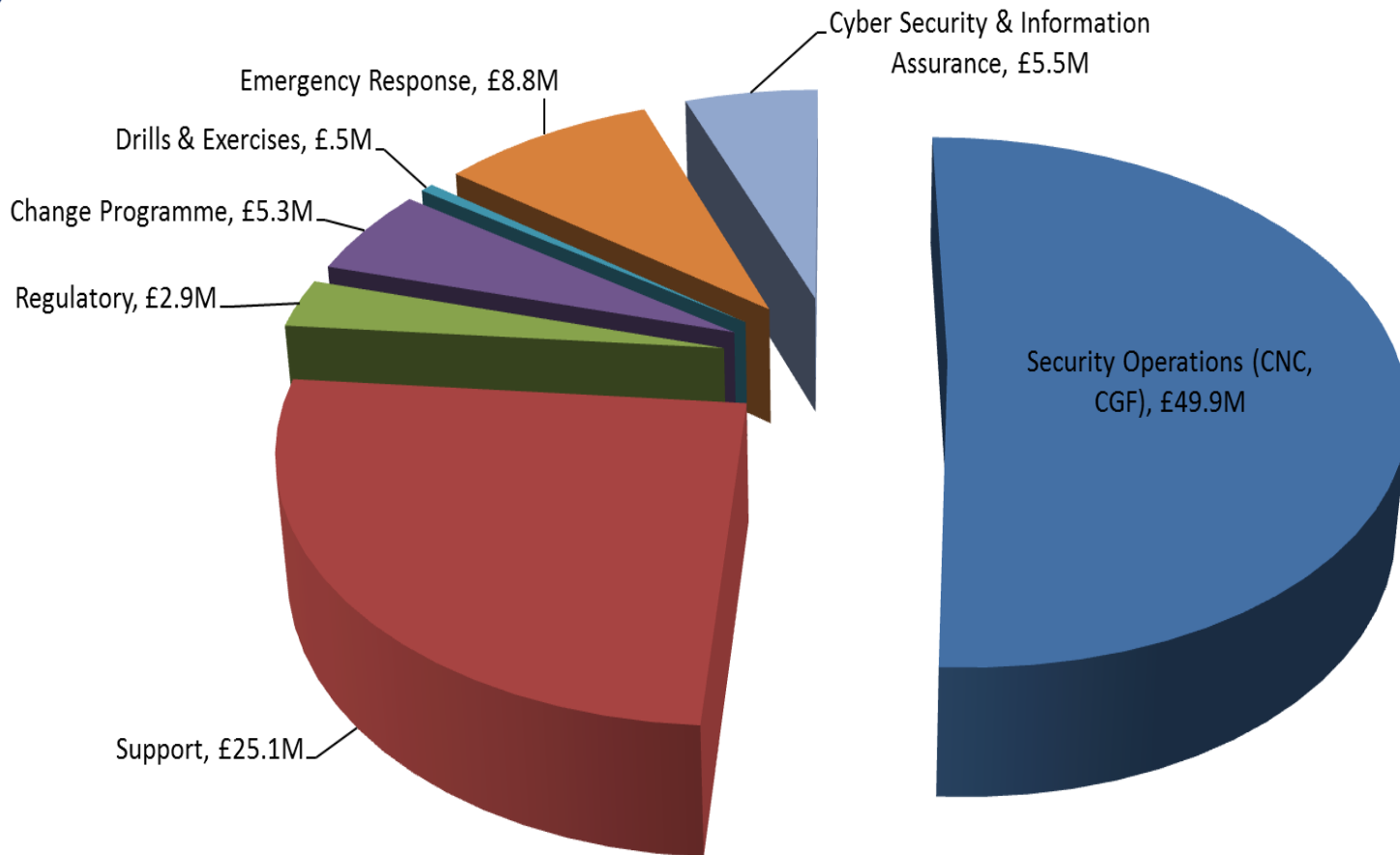
# Total Cyber Costs (Incl. forecasted Costs)



# Breakdown of 2018 Operational Budget



# Breakdown of 2018 Operational Cost



# Business Case Reflections

- All parties must occupy the 'right' space
- It's all about culture – change management is money well spent
- Capital structures can shape culture
- Consultants lack a deep understanding of the business environment – the role of the the 'Intelligent Client'
- Outcome focussed – seek to realise complementary benefits
- Programme vs Project
- Be resilient!



**Sellafield Ltd**