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WINS

Workshop on Maintaining Effective Security During
the Decommissioning of Nuclear Facilities

Sellafield Site in West Cumbria, UK



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.

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 2019
- 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.

Thinking differently about clean-up



Safe, Secure Site Stewardship



Demonstrable Progress



Return on Investment

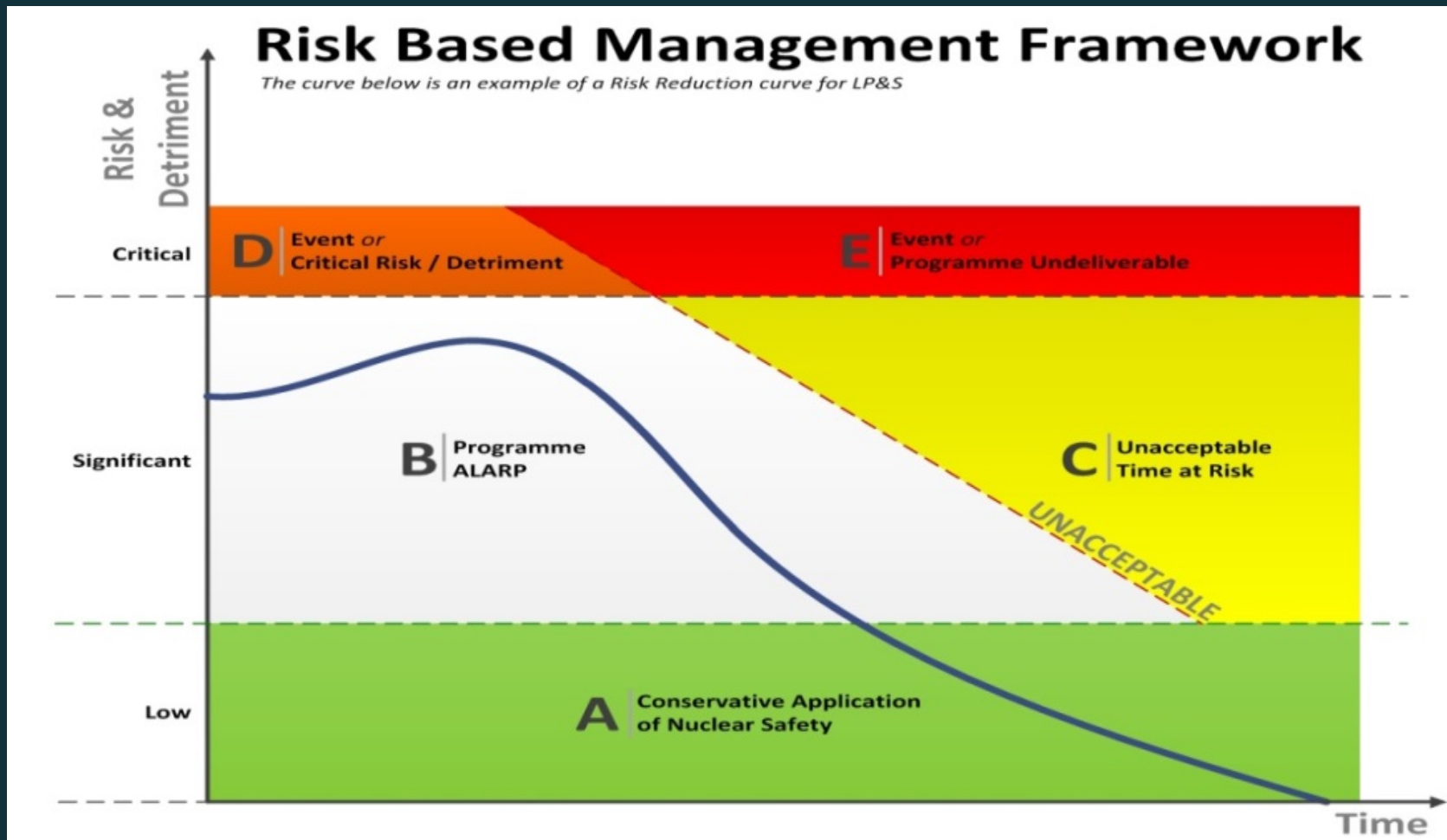


Integrated Nuclear Safety & Security

- Integrated approach to Nuclear Safety & Nuclear Security
- Based upon 'Risk Informed' decision making
- Balancing the nuclear & radiological risk with the security risk
- Unified Command, Control & Communications (C3) Model
- Based upon the IAEA principles of 'Defence-in-Depth' & 'Graded Approach'



Sellafield Ltd Risk Management Framework



Sellafield Operating / Organisational Model

- The Site Operating Model is structured into 7 areas of responsibility;

1. Enterprise Performance

Corporate Centre, Legal, HR, Finance,

2. Enterprise Professions

Technology, IT, Strategy & Planning,

3. Value Streams – 4 off

Spent Fuel Management, Special Nuclear Material, Retrievals & Remediation

4. Site Management – Service Organisation

Engineering, Maintenance & Asset care, Utilities Services, Safety, Security

5. Major Projects

6. Supply Chain & Commercial

7. Environmental, Safety & Security

Environmental, Health, Nuclear & Radiological Safety, Security, Emergency Management & Business Continuity.

Decommissioning & Security

- The responsibility for **decommissioning** rests with the **Remediation Value Stream**.
- The responsibility for the day to day delivery of the Nuclear Site Security Plan and On-Site Emergency Plan rests with **Site Management** as a service provider to the respective Value Streams.
- The responsibility for strategy, policy and assurance for the Nuclear Site Security Plan, On-Site Emergency Plan, Off-Site Emergency Plan and Business Continuity rests with **Environmental, Safety & Security Directorate**.
- Organisational Principle - Clear delineation of organisational responsibility.

Value Streams & Security Priorities

SPECIAL NUCLEAR MATERIALS

The Sellafield Site is the current long-term strategy for the storage of SNM in the UK.

There are a number of operational CAT I facilities across the site. New facilities are under construction.

The site security regime is dominated by the site CAT I categorization.

SPENT FUEL MANAGEMENT

The SFM Value Stream is focused on the operational storage and processing of HLW and ILW.

The HLW facilities are typically categorised as Vital Areas.

The ILW facilities are typically categorised as CAT II, CAT III Areas

RETRIEVALS

The Retrievals Value Stream is primarily focused operational retrievals / the removal of high hazard risks from legacy facilities.

These facilities are typically categorised as Vital Areas.

The site security regime for Vital Areas is similar to that for CAT I Areas.

REMEDIATION - DECOMMISSIONING

The Remediation Value Stream is focused on Post Operational Clean Out and Decommissioning.

These facilities are typically categorized as low priority CAT III and CAT IV facilities. (VLLW, LLW).

Decommissioning / Security Priorities

DECOMMISSIONING PRIORITIES

The business challenge is to decommission nuclear facilities in an effective and efficient manner. Reducing the time it takes to progress site remediation and support retrievals of VLLW and LLW through waste treatment plant operation.

Collaboration with the supply chain to deliver the mission and also create opportunities in terms of innovation and technology advancement.

SECURITY PRIORITIES

These facilities are typically categorized as low priority CAT III and CAT IV facilities potentially holding VLLW and LLW.

However, they are located in close proximity to operational CAT I facilities, Operational Spent Fuel Storage facilities, CAT II storage facilities, CAT III process facilities.

The site security regime is dominated by CAT I and Vital Area security arrangements.

Sellafield Decommissioning / Security Challenge - 1

The regulatory philosophy, published in April 2017 is aligned with the mature non-prescriptive nuclear safety regime and provides Duty Holders with a coherent regulatory approach.

The new Security Assessment Principles provides the regulatory framework for Sellafield Limited as the Duty Holder to apply proportionate security during decommissioning activities.

Therefore regulatory controls are not a constraint for Sellafield Limited.

Sellafield Decommissioning / Security Challenge - 2

The Sellafield site was established in the 1940's and continued to evolve over the decades in support UK civil nuclear programs.

There are around 650 facilities on the Sellafield Site, around 200 contain nuclear material.

Of these, 80 facilities have sufficient quantity to be categorized under the security regulations.

The challenge is that the Sellafield site is a complex operational industrial site.

Sellafield Decommissioning / Security Challenge - 3

There are 80 facilities that have sufficient quantity of NM/ORM to be categorized under the security regulations.

- CAT I,
- CAT II,
- CAT III, CAT IV
- Vital Areas

The Decommissioning facilities are adjacent to / in close proximity to operational facilities.

The site security regime is designed to meet the requirements of CAT I and Vital Area risk profiles.



Sellafield Ltd