



# IAEA International Conference on Radiation Safety

9-20 November 2020

Session 6: Applying the concepts of clearance and exemption

## Exemption and Clearance

### The Practitioner's Viewpoint



*Roger Coates, IRPA President*



# A Practitioner's Viewpoint

What I want to cover:

- Conservatism
- A systems approach
- The wider waste management perspective



# 1. Conservatism

Keynote presentation in session 12: Conservatism in Radiation Protection:

## Prudence and the Hidden Burden of Conservatism

- Including a case study of clearance



# Conservatisms in the system

	Description	Factor of Conservatism
a)	Application to a specific practice	3
b)	Conversion to Activity Concentration	3 - 15
c)	Practical measurement margin	1.5 – 2.5
d)	Sum of fractions	1.2 - 2
e)	Activity distribution	2 - 5
Cumulative Impact (Range)		33 - 1125
Typical Cumulative Impact		100 - 1000



# Implications - clearance

Is this money well spent??

Hence need to review the clearance Bq/g values:

- Could be **increased by at least a factor 10** and still meet the top tier criterion
- Or a **minimum of 1Bq/g** for any nuclide could be established
- But not much support at IAEA RASSC: “Yes, but ...not now.”
- **But it should still be on the agenda for the next round!**

## Co60 and Cs137 – Key nuclides

Clearance level 0.1 Bq/g – very low, and challenging in practice

This gives practical problems in measurement, including background considerations.

Consequence – too much material is unnecessarily routed to LLW

Not much flexibility in standard clearance using RS-G.1.7 – except avoiding over-conservatism in measurement.

Operators should perhaps consider conditional clearance where there is a little more flexibility



## 2. Systems Approach – a key lesson

- Safety Series 89 and RS-G.1.7 each looked at a sub-set of the clearance system, and the outcome is clearly sub-optimal.
- International organisations must consider the practical implementation of their recommendations, not just focus on concepts, theory and philosophy
  - i.e. a complete ‘big picture’ Systems Approach
- DS 500 ‘Application of the Concept of Clearance’ is a step in the right direction

### 3. The wider waste management perspective

**The Waste Hierarchy** – an internationally recognised good practice approach for all waste management



Reuse, Recycle and Recover are essential for responsible waste management

- these depend on clearance

# UK Experience (1)

- In the 90s the UK nuclear industry recognised the importance of clearance in the waste hierarchy.
  - But there was no commonality of approach
- A ‘Nuclear Industry Code of Practice’ was agreed
- The regulators were fully engaged: although they could not ‘approve’ the code, they agreed that it aligned with regulatory requirements, and gave it their support
- Hence clearance had a firm basis in the UK, with central support to address any issues

Clearance and Exemption  
Principles, Processes and Practices  
for Use by the  
Nuclear Industry

A Nuclear Industry Code of Practice



British Energy



NPL  
National Physical Laboratory

UKAEA  
Restoring our Environment

## UK Experience (2)



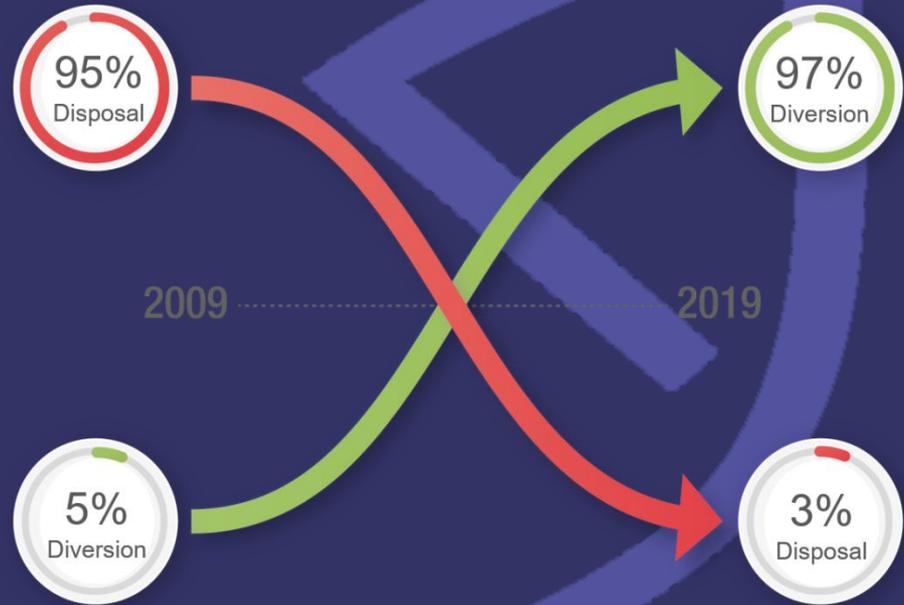
LLW Repository Ltd

- Until 2008 LLWR's sole role was to dispose of the UK's LLW
- In 2008 it was given the role to act as the UK 'conscience and coordinator' for all LLW issues, with a specific brief to promote the waste hierarchy to reduce disposals
- It now provides a forum for all interested parties to work together to address waste issues: waste producers, service providers, regulators, government policy makers
- It now employs more people to STOP waste coming for disposal

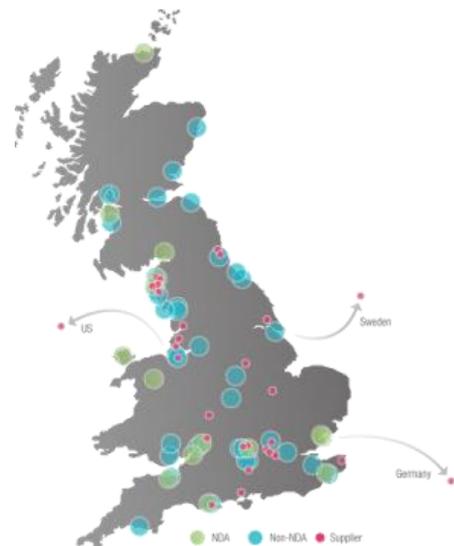
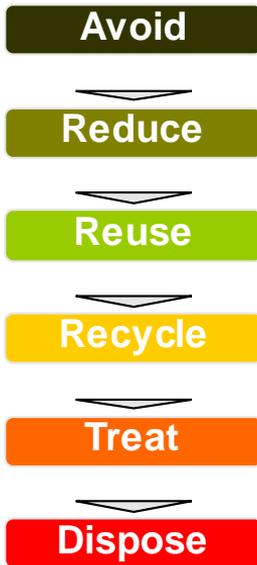
Over a ten year period, the disposal of waste has reduced enormously

- based on diversion to other components of the waste hierarchy

Clearance is vital enabler



# Making the waste hierarchy happen



## Key lessons from experience

- Clearance is complex and sensitive: it is challenging for any individual operator or waste producer
- There is great benefit from a cooperative approach across waste producers, service providers, regulators and policy makers
  - there is a great common interest in making the waste hierarchy come to life
- Need to look at the whole picture, and use all the options:
  - Reuse, recycle, recover all need an effective clearance system
  - Also use VLLW disposal, incineration & a 'special wastes' service
- With an increasing emphasis on decommissioning, clearance is essential—especially for metals recycling and concrete/rubble

## Conclusion

The nuclear industry and other radwaste producers have a MORAL DUTY to apply the waste hierarchy

In many countries the application of the waste hierarchy is national policy across all waste producers, in whatever field

## Conclusion

The nuclear industry and other radwaste producers have a MORAL DUTY to apply the waste hierarchy

In many countries the application of the waste hierarchy is national policy across all waste producers, in whatever field

We should therefore be making the clearance system easier, more effective and efficient, so that we can reuse/recycle/recover - as is good practice in other industries

**But we do seem intent on making it as hard as possible! Why?**