

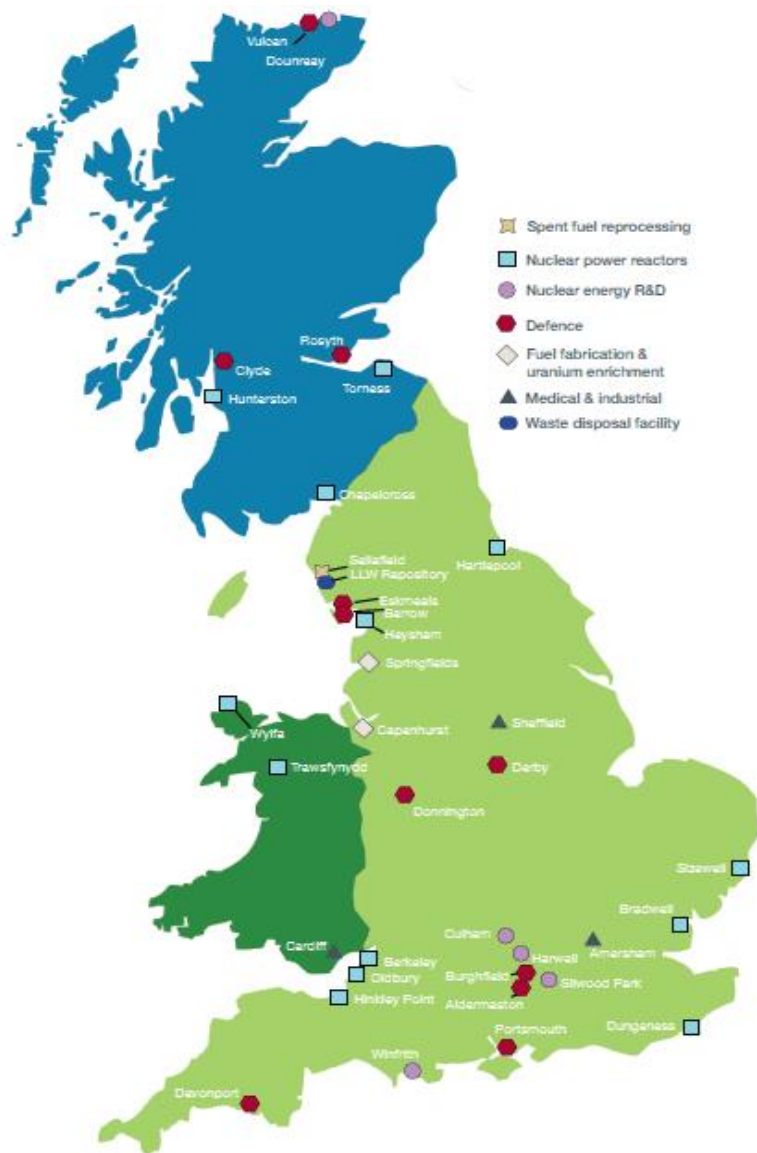
Legal and Policy Framework for Low Level Waste Treatment and Disposal

**Jonathan Leech
9 April 2014**

Overview

- Evolution of LLW policy
- Waste Hierarchy: policy and legislation
- Best available techniques
- Nuclear liabilities and LLW: compliance and risk

Radioactive Waste Inventory 2013



Volume by waste type (m ³)	
VLLW	2,800,000
LLW	1,400,000
ILW	290,000
HLW	1,100
Total	4,500,000*

*Excludes:

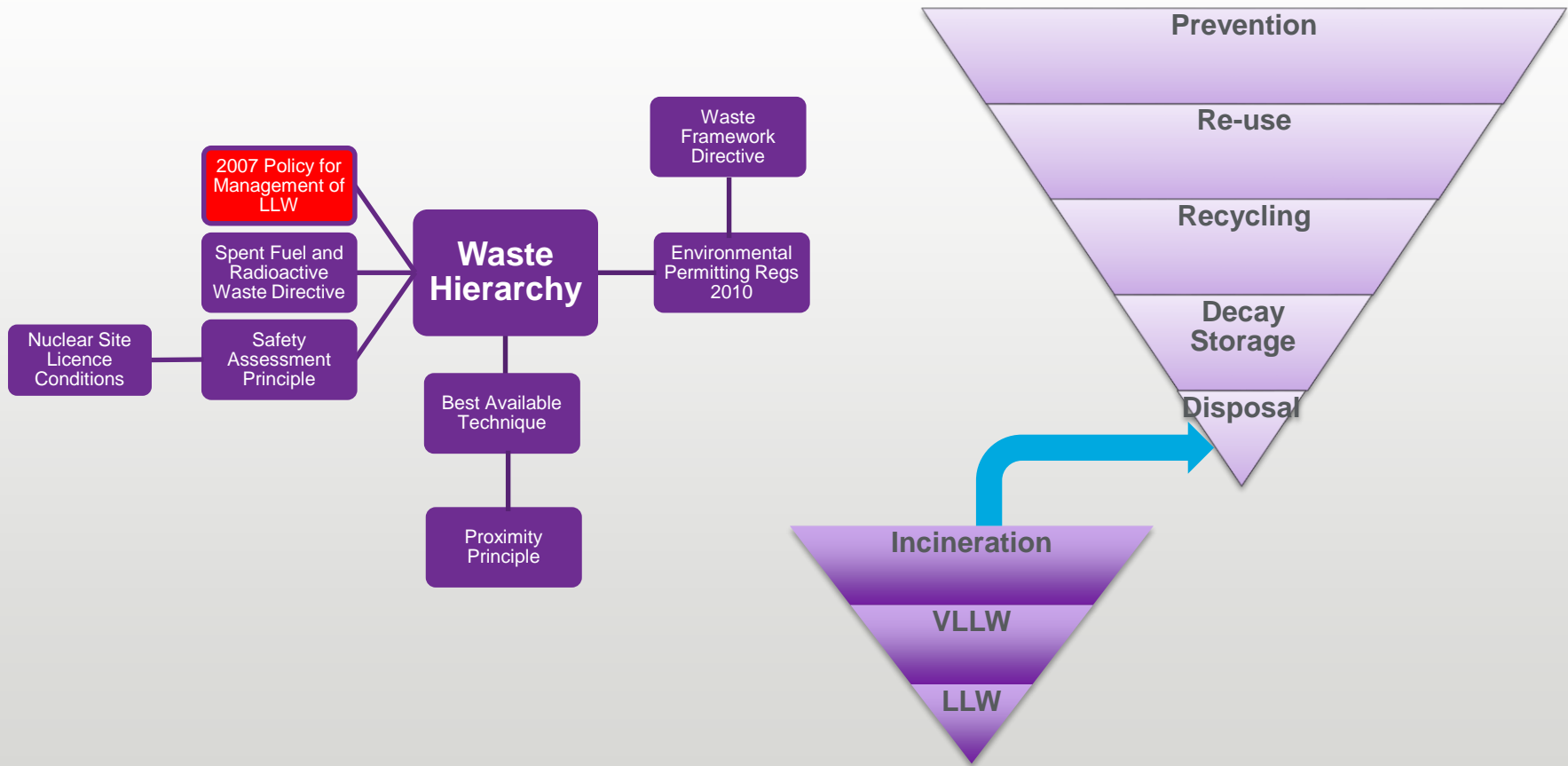
- uncharacterised ground
- NORM

LLW destination (2012)	
Disposal to landfill	42%
Metal waste recycled	24%
Disposal on site	14%
Disposal to LLWR	13%
Combustible waste treated	7%

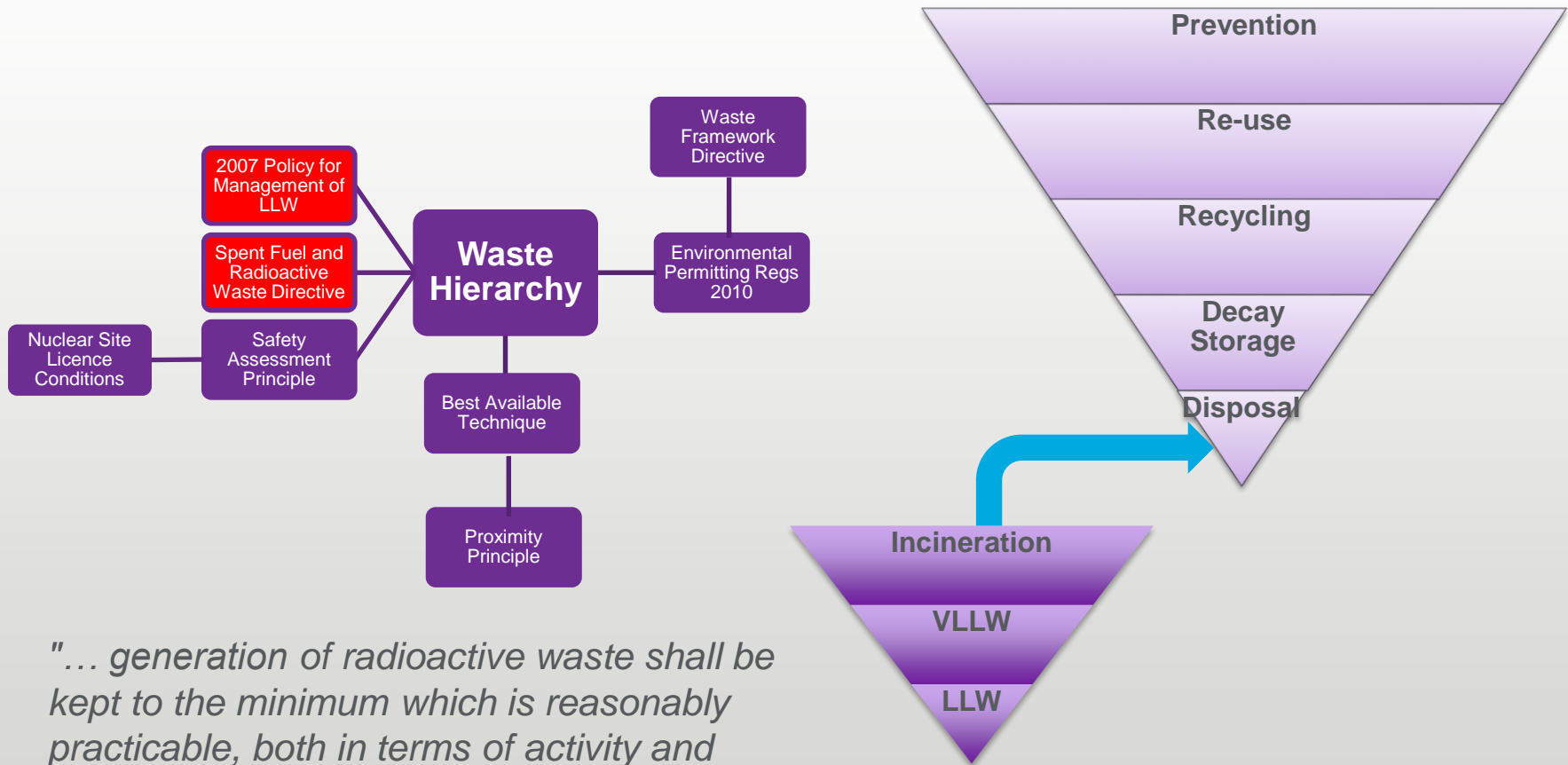
Policy and regulation



Waste hierarchy (radioactive waste)

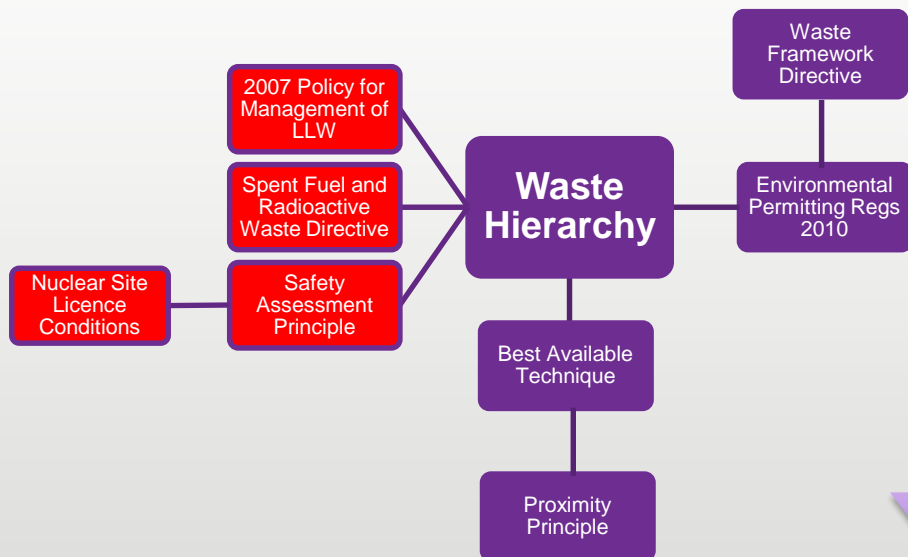


Waste hierarchy (radioactive waste)

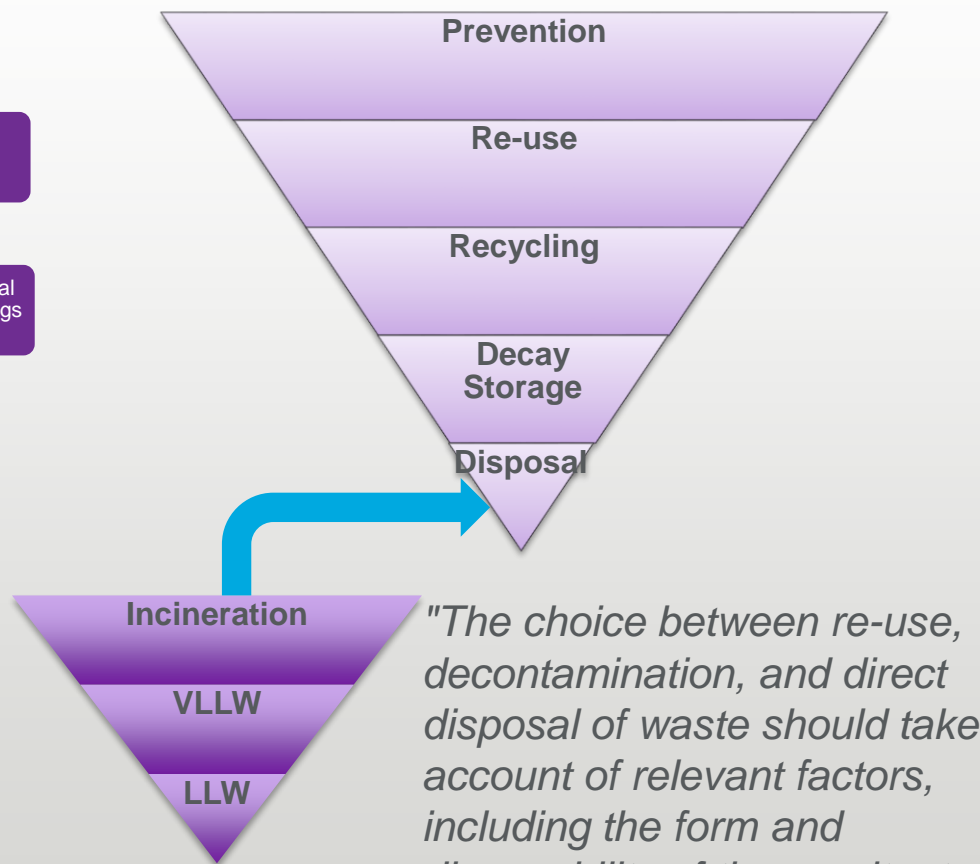


"... generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials ..."

Waste hierarchy (radioactive waste)

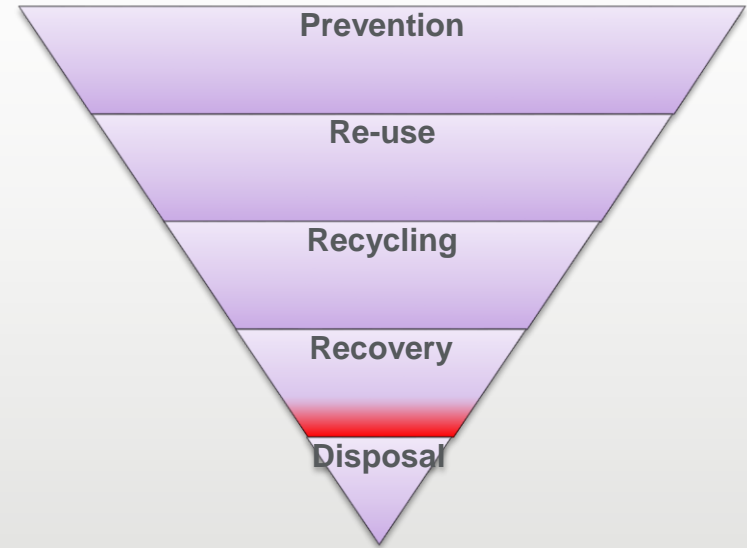


"... generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials ..."



"The choice between re-use, decontamination, and direct disposal of waste should take account of relevant factors, including the form and disposability of the resultant waste, dose to operators, and other waste arisings and resultant discharges."

Waste hierarchy (Waste Framework Directive)



Best available technique / proximity principle



BAT

- Environmental Permitting Regulations 2010: exposures kept “*as low as reasonably achievable, taking into account social and economic factors*”
- Environment agency guidance: “... optimal treatment and disposal routes (taking account of the waste hierarchy and the proximity principle)”
- Affordability and gross disproportionality

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Proximity principle

- 2007 LLW Policy: “appropriate consideration to the proximity principle and waste transport issues ...”
- Consider volume and activity and available modes of transport
- Broad overview of options
- Relevance to exposure to ionising radiation?

Roles and strategy



UK Low Level Waste Repository, Drigg, Cumbria

- NDA / LLW Repository Ltd
- UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry
 - Application of waste hierarchy
 - Preservation of LLW disposal capacity
 - Development of treatment and disposal routes
- LLW National Waste Programme
- Joint Waste Management Plans

LLW contractual hub



**waste
characterisation**



packaging



transport



metallic



combustible



supercompactable



very low level

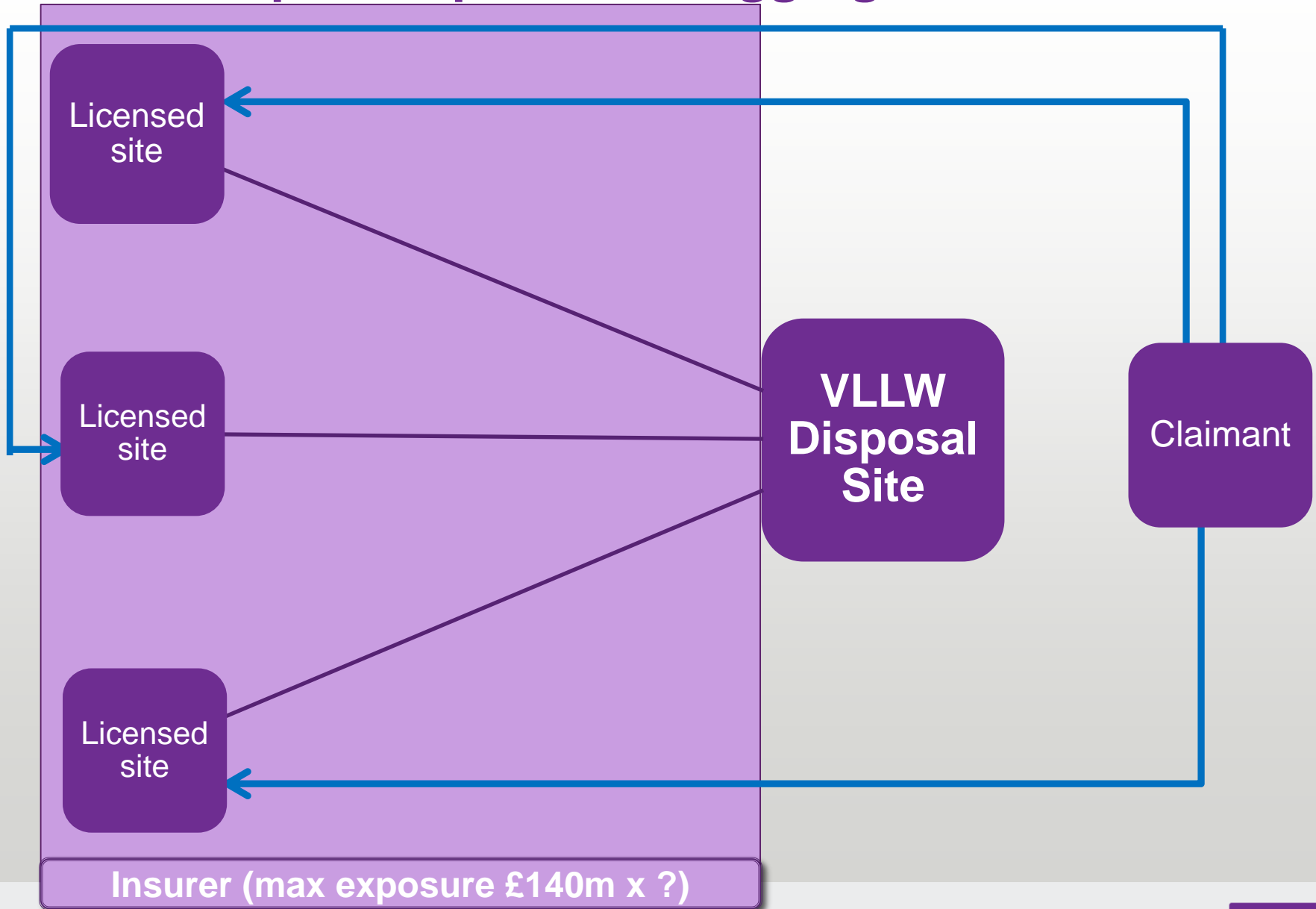


low level

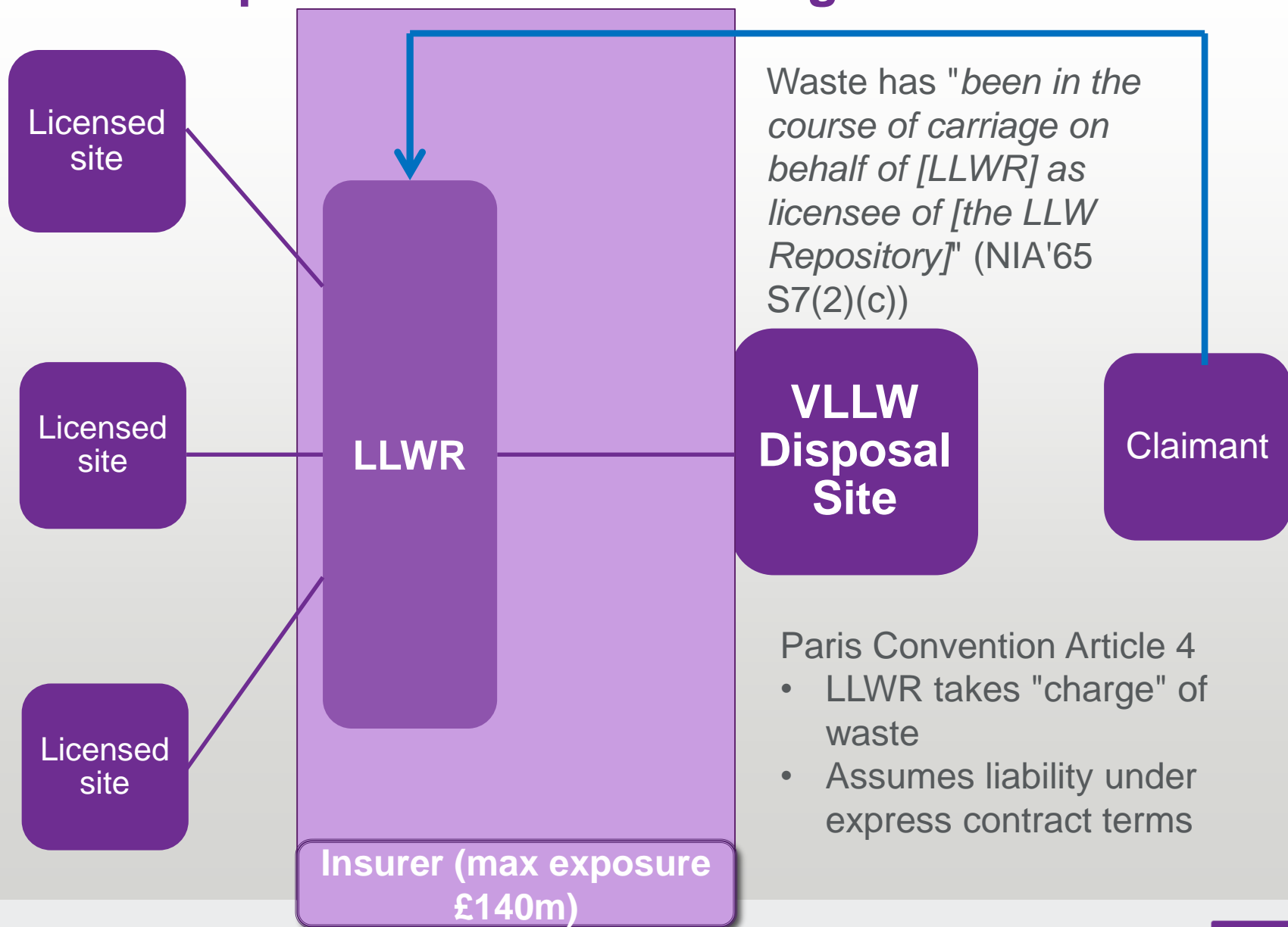
Nuclear liabilities conventions and VLLW

- Aggregation of risk
- The "relevant carriage" model
- 2004 Protocols
- Possible exclusion for disposal sites

VLLW disposal - perceived aggregation risk



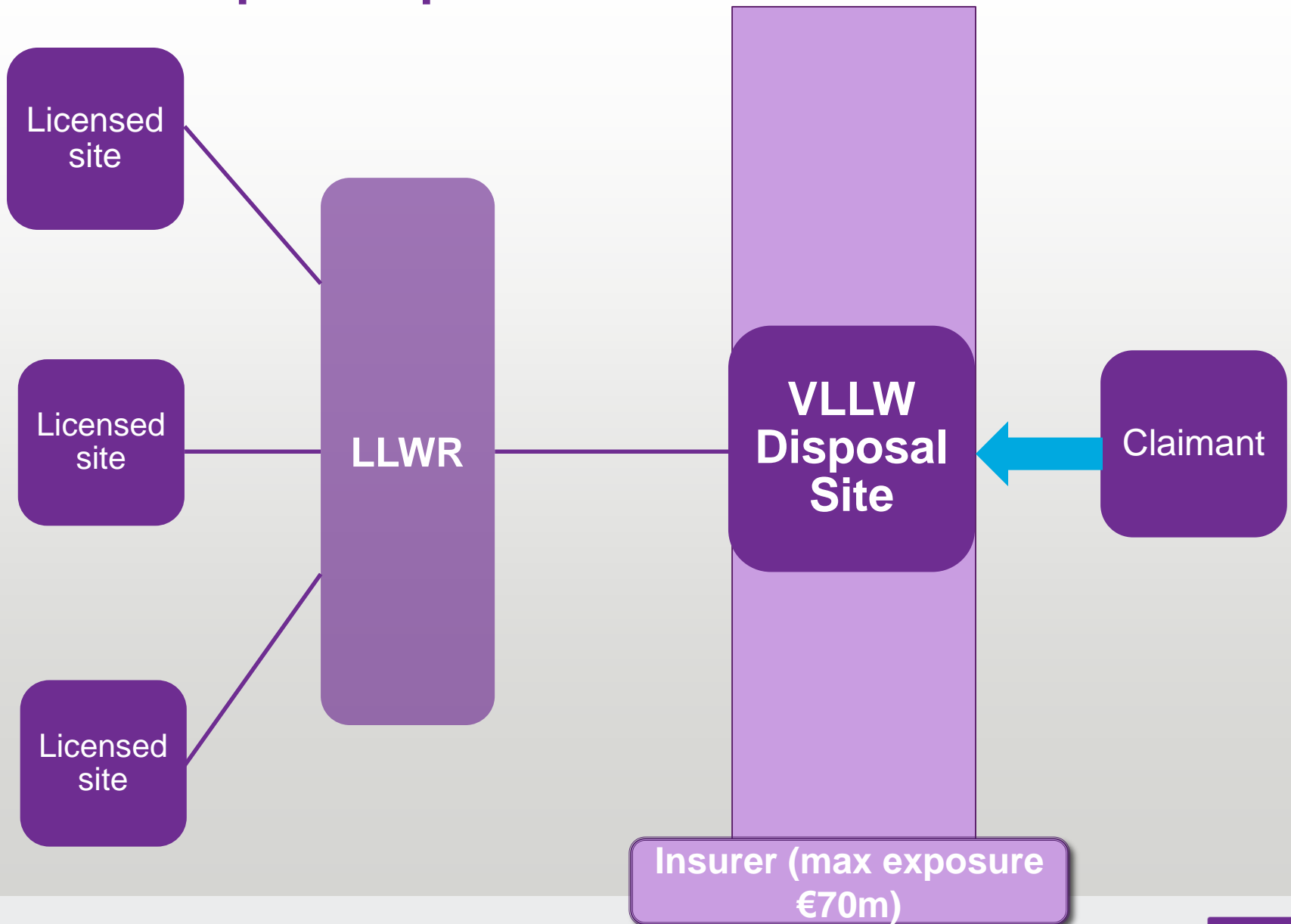
VLLW disposal - "relevant carriage"



Comparing Paris, Brussels and the 2004 Protocols

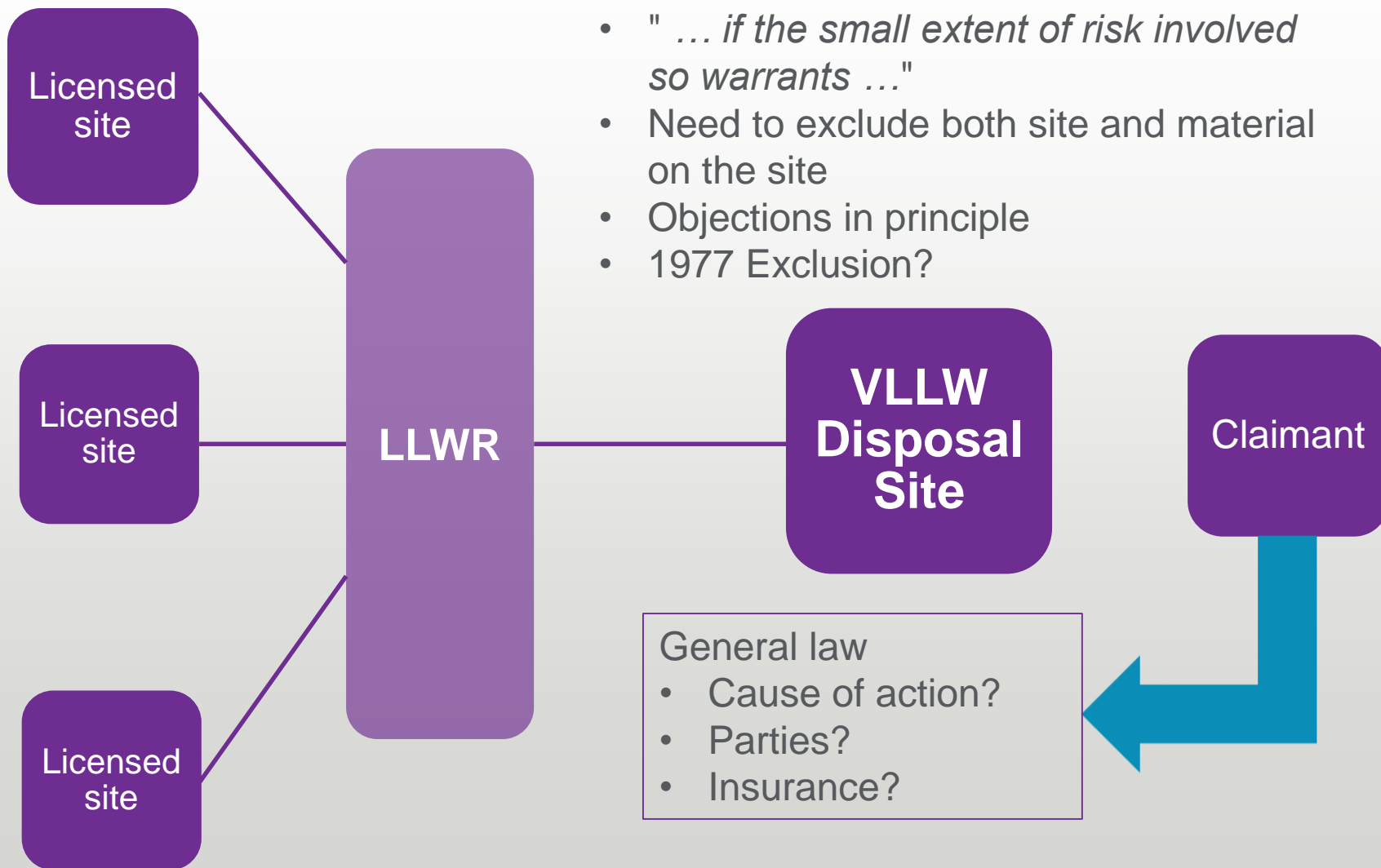
	Paris Convention	Brussels Convention	2004 Protocol
Nuclear installations covered	<ul style="list-style-type: none"> Reactors (non-transport) Factories for manufacture or processing of nuclear substances, separation of isotopes or fuel reprocessing Facilities for storage of nuclear substances 	As Paris	Additions <ul style="list-style-type: none"> Installations for disposal of nuclear substances Factories, facilities and installations in the course of decommissioning
Scope of loss	Injury, loss of life and damage to or loss of property	As Paris Convention	Additions <ul style="list-style-type: none"> Economic loss Cost of reinstating impaired environment Loss of income Cost of preventative measures
Time to bring claim	Within 10 years	As Paris Convention	<ul style="list-style-type: none"> Injury/loss of life: 30 years Other claims: within 10 years
Minimum cap on liability	SDR 15m	N/a	<ul style="list-style-type: none"> €700m €70m for low risk installations €80m for transport activities
Layer of state liability	None	Top up to SDR 175m	Top up to €1.2bn
Layer of liability shared between contracting states	None	Top-up from SDR 175m to SDR 300m	Top up from €1.2bn to €1.5bn

VLLW disposal - post 2004 Protocols



Possible exclusion of disposal sites

- " ... if the small extent of risk involved so warrants ..."
- Need to exclude both site and material on the site
- Objections in principle
- 1977 Exclusion?



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