Office for Nuclear Regulation

Thinking outside the box:

Lessons and experience that the major accident hazard and nuclear sectors can learn from each other

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Office for Nuclear Regulation

Great Britain

GB’s Office for Nuclear Regulation (ONR)

ONR is an independent statutory body

Formed in April 2014 on the commencement of the Energy Act 2013

Formerly agency of Health & Safety Executive (HSE)

Began as Nuclear Installations Inspectorate in 1960

Close liaison with other GB regulators in the sector (particularly HSE and the environment agencies)

Nuclear safety

Nuclear site health and safety (incl COMAH)

Nuclear security

Nuclear safeguards

Transport of radioactive materials

Presentation

- History
- Challenges
- Similarities and differences
- Key messages

What's in the box stays in the box, but…

…what happens if it gets outside?

When it goes wrong…on major accident hazards sites

Flixborough
1974

Buncefield
2005

Bhopal
1984

Texas City
2005

When it goes wrong…on nuclear sites

Windscale
1957

Chernobyl
1986

TMI-2
1979

Fukushima-Daiichi
2011

Similarities between major hazard and nuclear sectors

- Permissioning regimes in GB
- Generally high hazard low risk
- Risk profiles vary across the nuclear industry
- Inward and outward looking?
- Learning opportunities between major hazards and nuclear sites

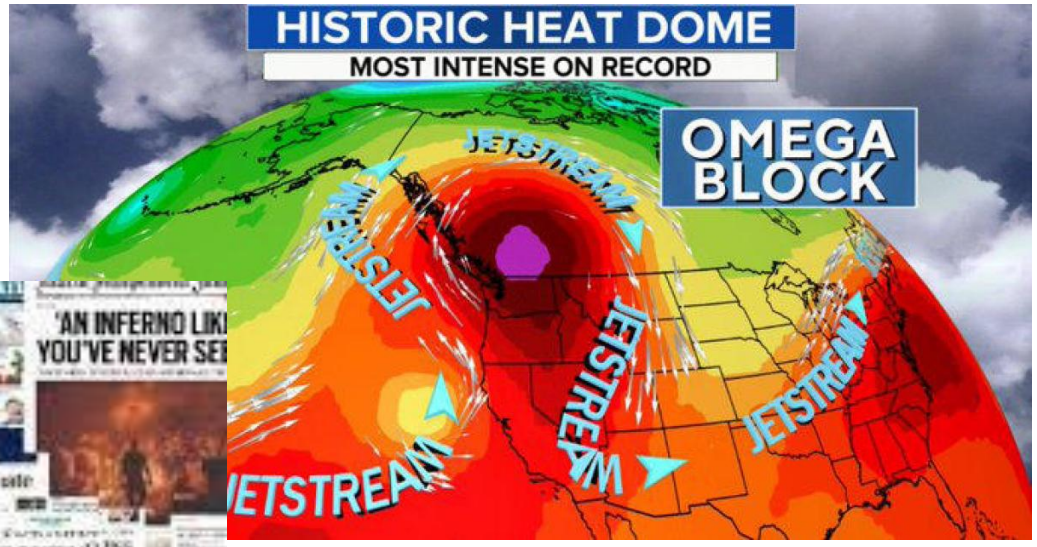
Risks to keeping it in the box:

- Human factors (incl. complacency)
- Ageing assets
- Threats (cyber security, terrorism)
- ***External hazards***

Consequences of accidents:

- Human
- Environmental
- Financial
- ***Reputational***

What is the major challenge today?



External Hazards 1 – Impact of climate change

Tropical storm Martin; France - 1999

Japanese earthquake and tsunami - 2011

Hurricane Harvey;
Texas - 2017

External Hazards 2

- Common cause of failure in flooding events – loss of power to site
- Root/underlying causes;
  - Poor design
  - Poor siting
  - Failure to provide adequate redundancy of essential systems
- Exacerbated by climate change
- Post-Fukushima stress tests now need reconsidering 10 years down line?

Generalised differences between major hazard and nuclear sectors

- Design issues
- Examination, inspection, maintenance, testing
- Hazard v risk
- GB regulatory regime – Safety Assessment Principles v Control of Major Accident Hazards Regulations 2015
- Safety case v safety report (GB regime)
- Regulatory interactions

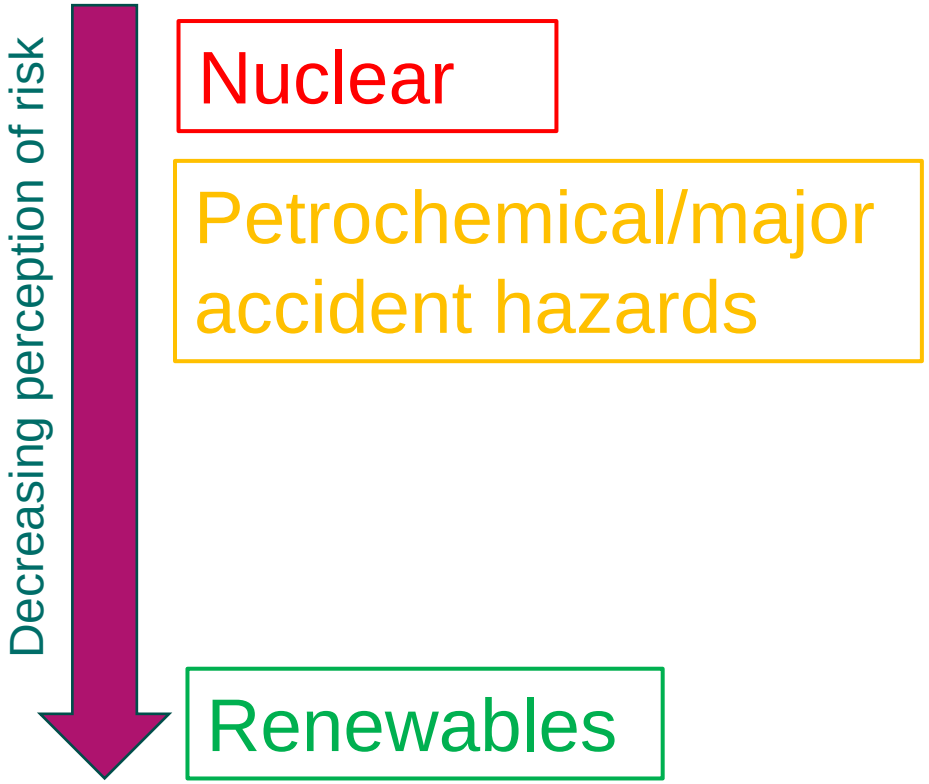
Reputational risks 1

Deny/defend or openness/transparency?

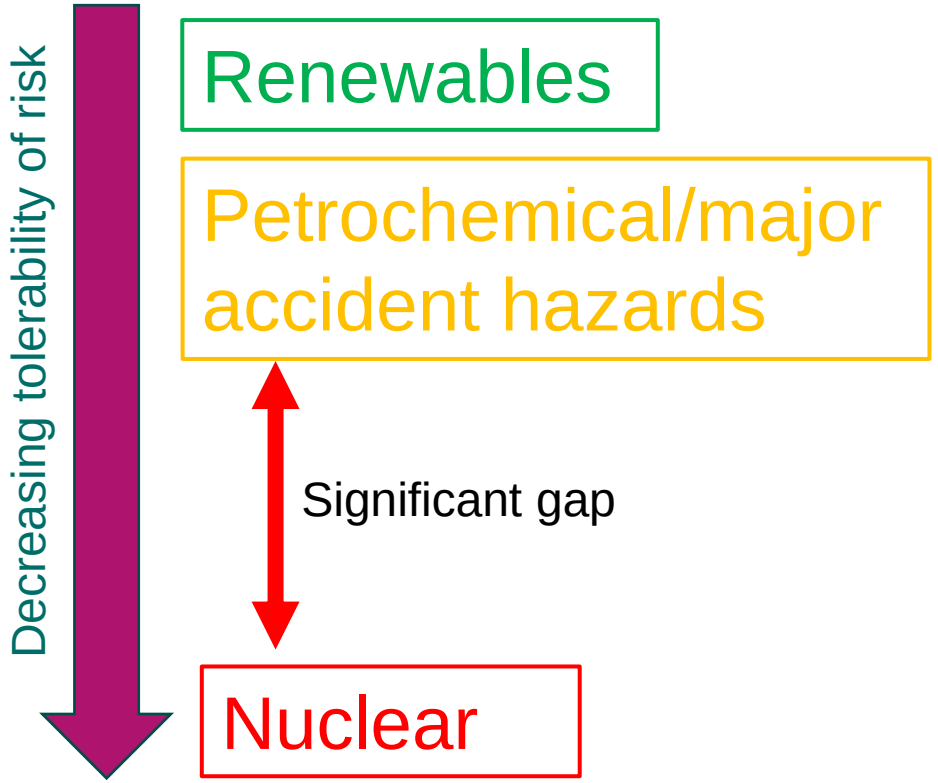
- Nuclear industry originally cloaked in secrecy
- WMD was original goal
- Rapid expansion post-WW2
- Public trust
- Civil nuclear industry transition to transparency

Reputational risks 2

- **Public perception of risk**



- **Public tolerability of risk**



Reputational risks 3

Sayano-Shushenskaya hydroelectric plant 2009

- 75 fatalities
- Extensive oil/PCB contamination of Yenisei River
- Any media coverage or reputational repercussions?

Key messages

- Balance hazard, risk and consequence
- Avoid self referencing
- Regulating innovation/new technology
- Plan early for decommissioning
- Tolerability/perception of risk

…and finally

- *What can major accident hazard sector learn from nuclear?*

Resilience and defence in depth for climate change

- *What can nuclear learn from major accident hazard sector?*

Seek operational experience from the major accident hazard sector

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Thank You – Questions?

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