

# Perspectives – Managing Risk??

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# Abiding impressions...

... that have resonated with us since last we met...in 2002, 2004, 2006, 2008.....

- **Sustainable Environmental Regulation** (2002) - people agreeing – sometimes ruefully
- **Risk Based Approach to Environmental Decision Making** (2004) - People agreeing – sometimes ruefully
- **Optimisation in Cleanup would be a good idea?** (2006) - People agreeing – sometimes ruefully
- **Nuclear Operations Costs and Benefits – robbing Peter . . . and starving Paul??** (2008) – Lots of people agreeing . . . but not progressing

# What's happening now?

Compare and contrast methodologies by various bodies at various levels

- Regulatory Justification
- NDA Business Case Methodology
- BPEO assessments

# Justification

The Secretary of State's Proposed Decision as Justifying Authority on the Regulatory Justification of the Class or Type of Practice . . . AP1000 . . . **DRAFT** Decision Document

Based on regulatory guidance such as:

*“In this respect, calculated average annual individual doses for a population group in the nanosievert (nSv/y) range or below should be ignored in the decision making process as the associated risks are minuscule and the contribution to total doses to individuals will be insignificant. Higher annual doses, up to say a few microsievert ( $\mu$ Sv/y) can be considered trivial but may require some consideration particularly if at the higher end of the range.”*

# Justification

3.51 Because of the significant potential health detriment associated with exposure to radiation, the emission of radiation from nuclear power stations is heavily restricted and emissions are kept at very low levels. These emissions are closely regulated and monitored in the UK by a regulatory regime . . . .

Does the regime work? ***Yes it does***

Are the doses small? ***Yes they are***

Is the health detriment therefore small? ***Yes it is***

Are benefits therefore > detriments? ***Yes they are***

Is the Practice justified? ***Yes it is***

# **NDA Business Case Methodology**

**EGG08 Rev 6 November 2009**

How this procedure considers discharges:

- Impact on radiological discharges measured in public dose to European population and truncated at 500 years.
- These should be profiled with time and total.
- Data Source – Existing discharge authorisations and site models
- £25K/man Sv based on NRPB study data and uplifted by RPI

**Monetary valuation – CBA based on 1993 method**

# BPEO Assessments

## Fuel Element Debris: Sizewell A Best Practicable Environmental Option Study, Feb 2008

- 4 options – max critical group dose  $0.017\mu\text{Sv/a}$
- Scored 1-10, weighting factor (average) 5.03%

But if this were valued (as in EGG08), the result is £0.000425 per individual per year

So an attribute valued at 4.3p per 100 critical group members per year had a 5% weight on a decision between options (*all spending public money*) of £8.7M - £33.6M

Crudely – £1.25M of decision margin on 4.4p of detriment (ratio 29.3M:1)

# BPEO Assessments

## Fuel Element Debris: Sizewell A Best Practicable Environmental Option Study, Feb 2008

Key factor – dose scored as ‘high = bad’ – no de minimis - and there will almost certainly be little change in scores or weights whether the dose is  $10\mu\text{Sv}$ ,  $1\mu\text{Sv}$ ,  $0.1\mu\text{Sv}$ ,  $0.01\mu\text{Sv}$ , etc, etc.

Note that this methodology can and will have an effect on decisions at doses where regulatory guidance says that they *should be ignored in the decision making process*

***A constant driver of dose reduction unaffected by the level of either risk or detriment***

# Some small differences . . . . ?

**Government Level**

**Dose small, detriment small**

**NDA Level**

**Dose small, small valuation**

**Project Level**

**Dose small, significant effect on decision - uncorrelated with dose or detriment**

# No shortage of guidance

## Statutory Guidance on Discharges, 2009

‘Where the prospective dose to the most exposed group of members of the public is below  $10\mu\text{Sv}/\text{y}$  from the overall discharges [of an operator] the Environment Agency should not seek to reduce further the discharge limits that are in place, provided the [operator] applies and continues to apply BAT’.

Or ‘ $10\mu\text{Sv}/\text{y}$  is a *de minimis* apart from when it’s not’

***BAT = BPM = Costs not Grossly Disproportionate = undefined = not really much help = business as usual and revert to arm-wrestling***

# And no shortage of methodologies

- **Cost Benefit Analysis (CBA):** evaluates costs and benefits of the impacts of an intervention in terms of the public's willingness to pay for them (benefits) or willingness to pay to avoid them (costs) using a suitable discount rate. Generally based on the Value of Statistical Life (VOSL)
- **Cost Effectiveness Analysis (CEA)** compares the relative costs and outcomes (effects) of two or more courses of action. Based on Quality Adjusted Life Year (QALY) i.e. Cost of (e.g.) treatment accounting for changes in both longevity and quality of life.

# No shortage of methodologies

- **J-Value:** evaluates costs and benefits of the impacts of an intervention in terms of the average economic output and work-life balance, suitably discounted – gives “*an objective, absolute and universal scale against which health-and-safety spend in any sector may be measured, providing an explicit judgment on whether the plan or scheme under consideration is reasonable*”

# But severe shortage of agreement . .

. . . on matters as fundamental as

- The valuation of health/life *per se*
- The use of discounting *per se*
- Use of economic activity to assess life worth – e.g. 1 life worth (USA) >>> 1 life worth (Developing Country)

**BUT** – in the case of Nuclear and the UK, the colour of the angels on the pinheads is surely secondary to the fact that **ALL** methodologies that use ICRP-type dose-risk relationships show disproportionately **LARGE** spend/detriment ratios for virtually **ALL** cases that we have studied at the ‘optimisation’ margins

# And what about 'hazard' reduction?

Currently unused 'tails' uranium is stored in steel containers as  $\text{UF}_6$

- $\text{UF}_6$  is nasty stuff – but it keeps the inside of its containers in pristine condition – and it's almost entirely a CHEMICAL hazard
- NII has instructed that UK stocks shall be deconverted to oxide with a start made by 2020 and is pressing to accelerate this
- BUT – deconversion will almost certainly put the uranium around £10K per tonne further away from being useful, and therefore £10K per tonne closer to being waste.
- There are methodologies for comparing chemical hazard potential – and LOTS of these chemicals within 10 miles of Capenhurst – is deconverting  $\text{UF}_6$  REALLY a UK priority?

# So – why is this serious . . . ?

**It should be no news to people that the UK is in an economic black hole, and that**

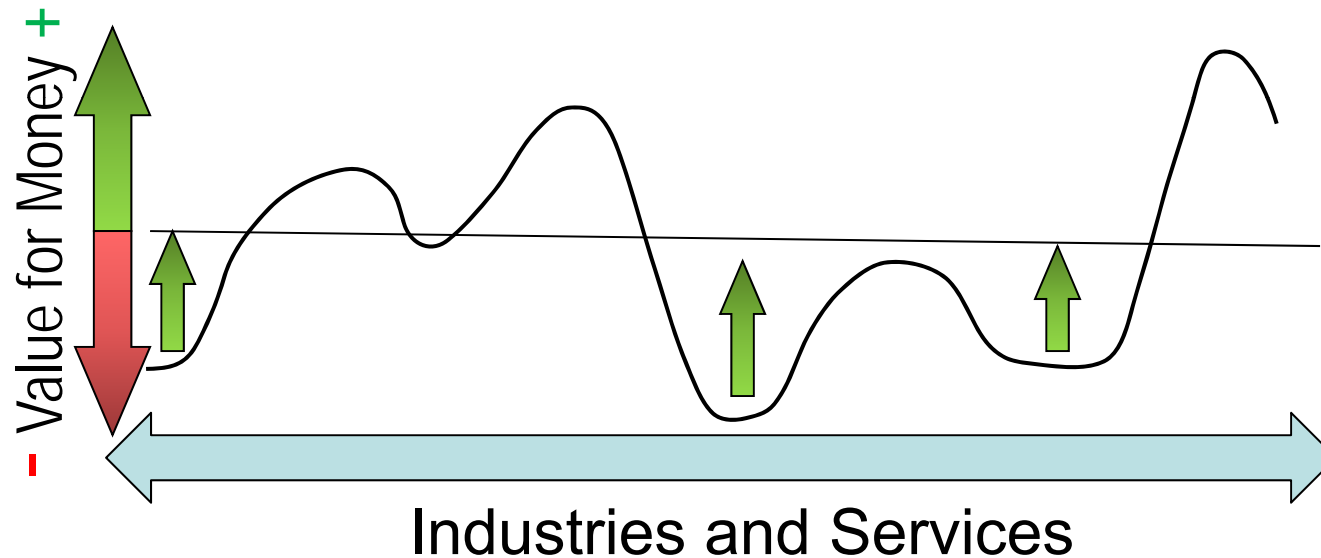
- People like the NDA will have financial strictures placed on them which will make ‘spending on the trivial’ even more of a limitation to progress
- People like EdF, E-On, RWE and Iberdrola have other places to spend their money if they see it being wasted in the UK
- People like the population of the UK have a right to expect at least an attempt at ‘value for not enough money’ and a right to know how and why their money is being spent

## So – what to do . . . ?

- the more extreme ‘*no man-made radiation near me ever*’ of us could do with being presented with the results of disproportionate spend in terms of who will die how and where from the direction of funds to this disproportionate spend
- The experts could do with valuing pragmatism over perfection – at least to the extent of agreeing an indicator which could inform Government on optimisation of spending

# And it would **GUIDE** not **TELL**

- The use of CBA and CEA methods will reveal hills and valleys in Value for Money across different industries and services



- Improved Value for Money measurement (economic/scientific) gives the opportunity to decide whether to seek **improvement** (socio/political) - and some backing for any decision

# And why now . . . ?

- Because there seems to be cross-party support for the DECC concept - which could enable a clear policy lead across the environment/business/finance interface
- Because the new Office of Nuclear Regulation will provide an opportunity to examine a broader, less adversarial balance of safety, health, environment and cost

. . and because – looking back to 2002, 2004, 2006, 2008.....

**It's about \*\*\*\*\* time!!!!**