ENVIRONMENT AGENCY

BPM/BPEO vs BAT

(A Personal View)

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ALARA

- BPM, BPEO & BAT all describe approaches to optimisation
- As such, relate to ICRP's optimisation principle for practices involving the use of radioactive substances:

  "in relation to any particular source within a practice, the magnitude of individual doses, the number of people exposed, and the likelihood of incurring exposures where these are not certain to be received should all be kept *as low as reasonably achievable*, economic and social factors being taken into account. …" [My italics]

ALARA

- Principle incorporated into European law through *Council Directive 96/29/Euratom Laying Down the Basic Safety Standards for the Health Protection of the General Public and Workers Against the Dangers of Ionizing Radiation*
- Incorporated into UK law for the Environment Agency's functions under the Radioactive Substances Act 1993, by *The Radioactive Substances (Basic Safety Standards) (England and Wales) Direction 2000* ["BSS Direction 2000"]

BSS Direction 2000

- Requires Environment Agency to ensure that (among other things) exposures of members of the public & the population as a whole resulting from the disposal of radioactive waste are kept ALARA, economic & social factors being taken into account
- Similar Direction to SEPA for Scotland
- Thus, legal requirement on EA & SEPA to apply ALARA principle
- Qualification carried through from ICRP via EC Directive, “economic & social factors being taken into account”

BPM

- Concept of BPM in pollution regulation is far from new
  - Used originally in UK primary legislation in section 5 of Alkali Act Amendment Act 1874
  - Part of radioactive waste regulation in UK since about 1960
- Describes valuable & important concept
  - But today used only in authorisations issued under Radioactive Substances Act 1993
  - Different but broadly equivalent terms used under other legislation
  - Use limited to UK

BPM

As introduced into 1874 Act:

"In addition to the condensation of muriatic acid gas as aforesaid, the owner of every alkali work shall use the best practicable means of preventing the discharge into the atmosphere of all other noxious gases arising from such work, or of rendering such gases harmless when discharged."

As remarked by Alkali Inspector in 1876:

"Some persons have expressed a fear that this bpm is not sufficiently definite and binding on the manufacturer. For my part I feel it to be more binding than a definite figure, even if that could be given, for it is an elastic band, and may be kept always tight as the knowledge of the methods of suppressing the evils complained of increases."

BPM

Definition given in White Paper *Managing the Nuclear Legacy: A strategy for action*, Cm 5552 (July 2002):

"A term used by the EA and SEPA in authorisations issued under the Radioactive Substances Act. Essentially, it requires operators to take all reasonably practicable measures in the design and operational management of their facilities to minimise discharges and disposals of radioactive waste, so as to achieve a high standard of protection for the public and the environment. BPM is applied to such aspects as minimising waste creation, abating discharges, and monitoring plant, discharges and the environment. It takes account of such factors as the availability and cost of relevant measures, operator safety and the benefits of reduced discharges and disposals."

BPEO

- Concept introduced in 1976 by Royal Commission on Environmental Pollution (RCEP)
- Use largely limited to UK
- *Radioactive Waste Management - The National Strategy*, issued by Department of Environment in July 1984, stated:

  "In discussing with waste producers how best to deal with particular types of waste, what the RCI [Radiochemical Inspectorate, responsible at the time for regulation under the Radioactive Substances Act] seeks to achieve is the best practicable environmental option in each case."

BPEO

RCEP 12th Report (1988) gave following definition of BPEO:

"… the outcome of a systematic and consultative decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term."

BPEO

- BPEO concept used in Part I of Environmental Protection Act 1990 (EPA 90)
  - Integrated pollution control (IPC) authorisations are to be based on BATNEEC (best available techniques not entailing excessive cost) taking account of BPEO assessments for substances released from processes
  - Only reference to BPEO in UK primary legislation

Statutory Guidance - BPM & BPEO

- Draft statutory guidance issued by DETR (now Defra) to Environment Agency in October 2000 on Regulation of Radioactive Discharges into Environment from Nuclear Sites
- Final version of statutory guidance still awaited
- Draft establishes obligation on Agency to ensure that operators on nuclear sites use BPM to control discharges
- Regarding BPEO, draft states:

"Radioactive discharges may arise in different physical forms, but need not necessarily be discharged in the form in which they arise. The Agency, before granting discharge authorizations, needs to be clear that alternatives, where they exist, are properly evaluated and the choice is made that will have a low environmental impact ie that the Best Practicable Environmental Option is chosen."

BAT

- BAT concept used in OSPAR Convention for protection of marine environment of North-East Atlantic for all types of industrial installations including nuclear
- Applied internally in nuclear context in many other European countries, e.g. France, Germany, Spain, Sweden
- EU has common rules on permitting for industrial installations, set out in *Integrated Pollution Prevention & Control (IPPC) Directive (1996)*, concerned with minimising pollution from various point sources throughout EU
- IPPC Directive invokes concept of BAT

BAT

The IPPC Directive defines BAT as follows:

“best available techniques” shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole.

- **‘techniques’** shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned,
- **‘available’** techniques shall mean those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member state in question, as long as they are reasonably accessible to the operator,
- **‘best’** shall mean most effective in achieving a high general level of protection of the environment as a whole.

BAT

- PPC being introduced & applied to wide range of UK industries:
  - Chemicals
  - Fuel & power
  - Pulp & paper
  - Textiles
  - Food & drink
  - Agriculture
- PPC uses BAT
- BAT includes element of driving towards cleaner technology, i.e. recognising a limit beyond which older, more polluting plant should be replaced, subject to the costs not being excessive
  - Not so apparent in BPM/BPEO regime

BPM/BPEO & BAT

Observation

BPM/BPEO (taken together) mean much the same as BAT, except that the BAT concept may be somewhat more advanced

ALARA, BPM/BPEO & BAT

- ALARA, BPM/BPEO & BAT are all moving targets, since developing societal values and advancing techniques may change what is currently regarded as “reasonably achievable”, “best practicable” & “best available”
- No longer largely about differential cost/benefit analysis (if they ever were)
- Now mainly about:
  - Culture of safety & environmental protection
  - Questioning attitude: can we do better?

ALARA, BPM/BPEO & BAT

- Why can’t we just use ALARA?
  - ICRP ALARA principle, as currently stated in ICRP 60, refers only to people, & not to environment
  - ALARA is impact-oriented, i.e. it relates to people’s exposures
  - BPM/BPEO & BAT are source-oriented, i.e. they relate to what the operator can control

BPM/BPEO - Pros & Cons

- Pros:
  - BPM (especially) & BPEO have been around for a long time - we can be proud of having invented the basic concepts & we're very familiar with them in the UK
  - BPM & BPEO are still embedded in UK Government policy for radioactive waste
- Cons:
  - Not used by anyone else (very much) internationally, so we constantly have to explain to others what they mean
  - BPM/BPEO approach not used in other UK permitting regimes
  - Wasted time & effort in deciding precisely where the intricate boundary between BPM & BPEO lies

Question

Should UK convert to using concept of BAT for regulating radioactive waste disposals?