

Ethical Aspects of Radioactive Waste Disposal

C. McCombie, Switzerland

Addressing radiation protection responsibilities within the scope of most current waste management practices requires a philosophical or ethical basis that is primarily concerned with the issue of **intra-generational equity**. Are we being fair and equitable to our present society? Key questions are whether we are making the best use of society's resources and whether we are involving all segments of society properly in the decision making. The situation is different when we consider the case of disposal of long-lived radioactive waste. The key issue is then whether we are being fair to future generations – i.e. it is a question of **inter-generational equity**. Properly designed and sited repositories will present only low levels of risk - but these risks are predicted to peak only after many thousands of years. It is obvious, therefore, that this disposal involves the present and immediately following generations investing resources into the protection of far-future individuals and that any negative impacts are more likely to affect far-future generations who will not directly benefit from the activities producing waste and who will not have shared in the relevant decision making.

There are, in fact, other activities today for which the same dilemma arises. Global warming due to CO₂ is the most topical subject, but there are numerous older examples for which the issue of fairness to future generations has not been recognised explicitly enough. A clear case is the exploitation of natural resources in the earth's crust. The fact that our current voracious consumption of fossil fuels will exhaust in centuries valuable resources which have been built up over millions of years, leaving future generations a fundamentally altered planet, deserves more emphasis in ethical debates.

At a national level there have been numerous meetings and position papers on ethical issues. The ideas developed in national programmes and many others have fed into international efforts aimed at achieving consensus on the ethical aspects of waste disposal. As a result, the IAEA produced in 1995, following a long period of iterative comments, an important document entitled "The Principles of Radioactive Waste Management". A further important document is the "Collective Opinion on the Environmental and Ethical Basis of Geological Disposal" produced by the NEA/IAEA/ EEC in 1995.

In the IAEA paper on waste management, the following 2 principles are most directly related to issues of ethics: Principle 4: Protection of future generations; Principle 5: Radioactive waste shall be managed in a way that will not impose burdens on future generations.

In the background text to the Collective Opinion, it is recognised "that each generation leaves a heritage to posterity involving a mix of burdens and benefits and that today's decisions may foreclose options or open new horizons for the future". Two issues are strongly emphasised. One is that "a waste management strategy should not be based on a presumption of a stable societal structure for the indefinite future, nor of technological advance". This principle leads to rejection of indefinite storage strategies in favour of geologic disposal concepts offering permanent protection. The second issue in the Collective Opinion is the wish to ensure that one does "not unduly restrict the freedom of choice of future generations". It is judged that an incremental process, involving development of deep repositories in a stepwise fashion over decades, meets this requirement - even when disposal facilities have no deliberate provisions for waste retrieval following repository closure.

Deep geological disposal can ensure safety for all future generations without imposing significant burdens on society after the closure of a well engineered and well sited repository. There is no other currently feasible way to ensure safety for future generations. Every responsible nuclear programme should have a **credible geological disposal strategy** that ensures safety at all times and leaves choices open as far as is consistent with this safety goal. One key component of such a strategy is the existence of a technically and societally acceptable site or sites.

To maintain a credible and ethically correct future programme, the USA could take the following actions:

- Initiate a new siting programme that is broad based and that includes willingness of a local community to host a deep repository. The NAS report, "One Step at a Time" gives guidance.
- Continue work on advanced technologies that might positively affect the nature or the volumes of the long-lived radioactive wastes to be disposed of in the future.
- Consider more closely the relative importance of inter- and intra-generational equity – and reallocate resources if necessary.