

A Background Paper by Andy Stirling addressed the precautionary principle. I provided comments on this in my submission Stirnwmo.doc posted 2003 November 28. The NWMO's Final Study continues to interpret the precautionary principle in a manner that I consider illogical. The following editorial by Richard V. Osborne, Founding President of the Canadian Radiation Protection Association, explains better than I could why the NWMO should be guided by the ALARA Principle in preference to the Precautionary Principle.

Editorial for Bulletin of the Canadian Radiation Protection Association

A Cautionary Tale

Richard V. Osborne

The past decade has been a period of introspection in the radiological protection community. The International Commission on Radiological Protection (ICRP) has set out to produce a new set of recommendations; a draft document has been produced and made available on the ICRP web-site. The draft has been widely reviewed and support for the proposed recommendations has been muted to say the least [1]. As we wait for the next draft it seems worthwhile to reaffirm the fundamental base for radiological protection as we practise it. The base is the set of three principles; justification, protection of the individual, and optimization of protection (the ALARA principle). Their importance seems to be lost in the detail of the draft recommendations. I feel that without a clear statement of their primacy in the protection system we are in danger of the minutiae of the recommendations being applied in a far too arbitrary and restrictive way. There is a hint of this in the draft ICRP document on optimization that was available for review earlier this summer, in which it is argued that the so-called *precautionary principle* has been the driver for the evolution of the ICRP's thinking [2]. Some argue, correctly I believe, that this is not really a principle; it is more a poorly-defined and open-ended method of handling or reacting to uncertainties in our knowledge of risk. We see the precautionary principle rather loosely invoked in some risk management decisions as justifying arbitrary safety factors. "Applying the precautionary principle" sounds more substantial and scientific than just saying "to be on the safe side". The influence of the principle is far more widespread though.

The idea behind the precautionary principle originated in Germany in the 1960s but it was not until 1982 that it was endorsed internationally when the UN included it in the World Charter for Nature. It gained prominence in European treaties and was advocated by the UN Rio Declaration on Environment and Development in 1992. Initially the idea was that "uncertainty does not justify inaction". The idea evolved and precaution began to take the place of science-based risk assessment and management. By the late 1990s the idea was that uncertainty also required shifting the burden and standard of proof [3]. The principle became "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context, the proponent of an activity, rather than the public, should bear the burden of proof." [4,5]

In other words, uncertain risk requires forbidding the potentially risky activity until the proponent of the activity demonstrates that it poses no (or acceptable) risk. We are all aware of the impossibility of proving a zero but this wording may sound reasonable provided that the parenthetic “or acceptable” is the operative qualifier. For many though, it is not. Adams has described what he calls the *environmentalist paradigm*, in which possibility replaces probability as a criterion for protection regulation, and any agent harmful at high doses is considered harmful at exceedingly low doses [6]. Only zero risk is then acceptable when the precautionary principle is applied. This is a stultifying situation. Morris comments, in a broad-ranging critique, that the precautionary principle not only lacks any clear guidance on when and how it does apply, but perhaps more importantly it is devoid of any limitations of when it does apply [7]. Without such limitations, he notes, the precautionary principle will be a vacuum that can consume any and all products and technologies, since some risk and uncertainty is associated with every human activity. We could conclude that in radiological protection we would have no optimizing; no applying the ALARA principle.

Radiation regulations based on the three fundamental ICRP principles have achieved an acceptable level of protection for decades. We should not abandon them to the arbitrariness of the precautionary principle when we have a sound basis for radiological protection in the clearly-enunciated principles of justification, individual dose limitation and optimization of protection. Radiological protection based on these principles includes elements of precaution. Why do we need a precautionary principle? This has been indirectly answered by asking: What if we were to apply the precautionary principle to itself? Its application carries the burden of untold risks and uncertainties. Thus, by its own definition, it should be abandoned [4].

This is not to argue that we should throw caution to the wind. The key is reasonableness. As Nilsson points out, though it is certainly better to be safe than sorry, it is important to distinguish unjustified precautionary action from justifiable precautionary action based on sound science and an appropriate assessment of the costs and benefits of taking action [8]. The precautionary principle fails to distinguish between the two, by elevating to the status of universal “principle” a notion that is only narrowly applicable.

In Canada we are fortunate that we have sensible wording in the Federal Nuclear Safety and Control Act that provides the framework for many of the radiological protection regulations in Canada [9]. Part of its stated purpose is the limitation, *to a reasonable level*, of the risks to the health and safety of persons and the environment. The ICRP principle of dose limitation and the ALARA principle are coherent with this. Further, the Federal Government’s Privy Council Office (PCO) has published guidance for its agencies on the application of precaution in science-based decision-making that reinforces the approach we have been taking in radiological protection and, in particular, emphasizes the importance of what is in essence the ALARA principle [10]. It notes that sound scientific information and its evaluation must be the basis for applying precaution. Peer review represents a concrete test for the practical application of precaution to decision making. A peer-review process can assess the soundness of the scientific evidence and its inherent credibility within the scientific community. Scientific advisors

should give weight to peer-reviewed science and aim at sound and reasonable evidence on which to base their judgments. Moreover, the science function can be further supplemented by formal, structured and, where warranted, independent advisory processes that include widely recognized and credible individuals. I believe we can heartily subscribe to this.

The guidance document lays out five principles that should guide the application of precautionary measures. They should be:

- Subject to reconsideration, on the basis of the evolution of science, technology and society's chosen level of protection.
- Proportional to the potential severity of the risk being addressed and to society's chosen level of protection.
- Non-discriminatory and consistent with measures taken in similar circumstances.
- Cost-effective, with the goal of generating an overall net benefit for society at least cost, and efficiency in the choice of measures.
- Finally, where more than one option reasonably meets the above characteristics, then the least trade-restrictive measure should be applied.

We can see all three radiological protection principles reflected in this guidance. Particularly important is the emphasis on the link to scientific knowledge, rather than the whims of activist groups, together with the exhortation to assess the real and potential impacts of making a precautionary decision (whether to act or not to act), including social, economic and other relevant factors and risk-risk trade-offs. Apply the ALARA principle in other words. The guidance concludes with the expectation that Canadian agency officials will consider its guiding principles in decision-making and will work together in developing, in consultation with their stakeholders, guidance for the application of precaution in their particular area of responsibility.

One area in radiological protection area where this guidance might well be applied is in the recommendations of the Nuclear Waste Management Organization (NWMO) for managing nuclear fuel. The draft study report from the NWMO has recently been released for comment [11]. Given the reservations about the precautionary principle outlined here, it is rather disconcerting to find the principle explicitly embraced in the project without any of the caveats. The report tacks on the idea that the greater benefit of the doubt will be granted to the environment and to public health than to the activities that may be held to threaten these things. We should hope that the guidance of the PCO is heeded and that injudicious application of the precautionary principle does not prove to be an impediment to development of the NWMO's ideas.

The ICRP may choose in its new recommendations to change the emphasis on the three principles as a set, or on their relative importance, but I believe that we should continue in Canada to regard them as fundamental to radiological protection. There is no need to place the long-standing base of radiological protection – the principles of justification, optimization and protection of the individual – as somehow derivative from, or subservient to, what is termed the precautionary principle.

References

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