T. Lazo*

Radiological risks from a social perspective

Contemporary society has become increasingly interested in actively participating in public decision making regarding health, safety and environmental protection issues. As governments have tried to better understand society's interests, and to better integrate societal needs in their decision-making processes, it has become possible to begin identifying common policy issues and lessons.

Trends in the nuclear industry in respect of social considerations mirror those observed for broader governance questions. Within the radiological protection community, stakeholder issues have moved steadily to the forefront of policy discussions, and clearly form key elements in decisions regarding the development and implementation of radiological protection policy.

Society's interest in radiological risk identification, assessment and management issues is often reflected in the press. For example, significant coverage was given to the efforts recently made to investigate the role of depleted uranium in the "Gulf War Syndrome", and in what will no doubt be dubbed the Balkan War Syndrome. This was driven not by concerns from the radiation protection community, but from public and political concerns. Other recent examples of radiological situations that caught the eye of political leaders, the public and the press include:

- the OSPAR Sintra agreement, through which governments will attempt to reduce towards zero the concentrations of various radionuclides in the marine environment; and
- European discussions regarding surface contamination on spent nuclear fuel transport casks.

** Dr. Ted Lazo is Head of the Radiation Protection Programme in the NEA Radiation Protection and Radioactive Waste Management Division (e-mail: lazo@nea.fr).*

On a more local scale, there are numerous cases of sites that have become, for one reason or another, radiologically contaminated. The management of these sites, which often includes clean-up activities aimed at releasing the site from radiological regulatory control, has in many national contexts attracted great interest from local populations, and from national and international NGOs.

These are concrete examples of the type of emerging radiation protection problems that can easily become front-page news and can incite considerable political and public interest. These situations are sometimes characterised by radiation protection professionals as "much ado about nothing" in terms of absolute risk. However, the political and public reactions to these situations illustrate quite clearly that, even though the "experts" may not feel that something is a problem, politicians and the public may feel quite differently.

How clean is clean enough?

These types of situations tend to raise fairly difficult questions. For example, many sites contaminated by past industrial practices or accidents are in the process of being cleaned up, with the ultimate objective being to release the sites for unrestricted use. Such sites exist in many countries around the world. A key question raised here is, how clean is clean enough?

From the "classical" radiation protection standpoint, a differential cost-benefit analysis, or even a multifactorial analysis can be performed to determine the "optimum" radiation protection approach. This is possible because the absolute value of radiological risks can be estimated, as can the costs associated with the estimated health detriment (usually expressed as a number of cancers) that would result from this radiological risk. In this case, the optimisation would calculate the costs of clean-up activities such that residual contamination levels left in soil and in buildings remaining on the site would not be higher than some predetermined level, and in any case below current regulatory dose limits. From this level of residual contamination, the expected dose to various hypothetical groups living on the site after its release could be calculated, and the health detriment resulting from this exposure could be estimated. The "cost" of clean-up is then compared to the "cost" of the health detriment. Calculations are reiterated until these two costs are equal, and this is defined as the "optimum" radiation protection solution.

However, as with many types of risk in modern society, governments are less and less able to select "acceptable" levels of risk such as those calculated as above without having at the very least consulted the potentially effected public. What is judged to be "acceptable risk" by government and regulatory organisations may be seen by that public as being totally unacceptable.

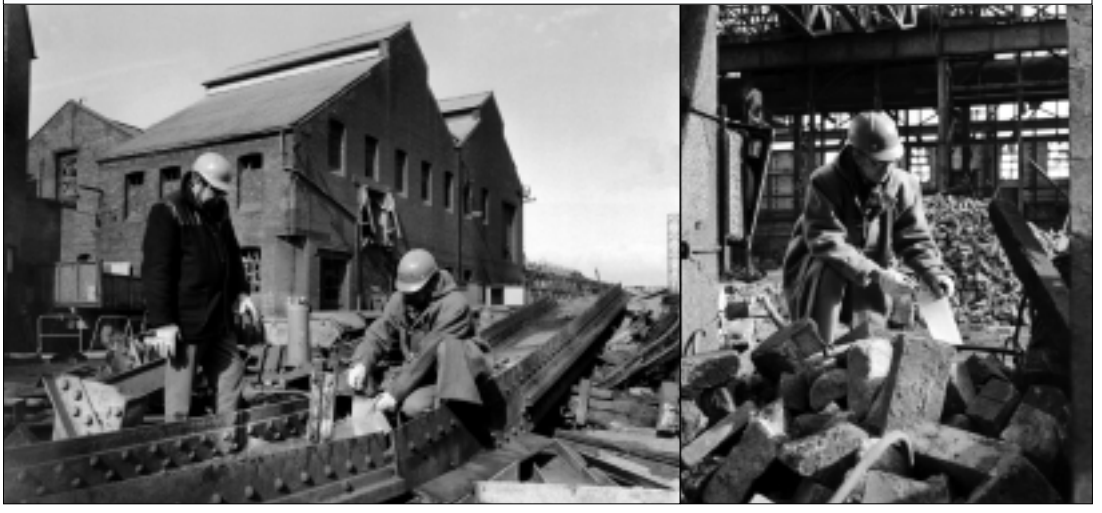
The boundary between science and acceptance

The clear lesson that can be drawn from this is that there is a great need to more clearly recognise the boundaries between the scientific aspects of risk assessment, the social aspects of risk identification and management, and the regulatory aspects of risk management. The question, "how clean is clean enough", is not a scientific question, but a social question. Other questions that need to be asked in this context include:

- How do regulators and governments share the responsibility of making *social judgements* with regard to what is *an acceptable risk*?
- How can the regulator, who is often charged with making these judgements on behalf of the government, develop a *process* that leads to decisions that are sufficiently *open* and *transparent*, while at the same time maintaining *independence*?
- How do regulators judge and balance the needs of often competing interests, such as industry, local public groups, national and international environmental NGOs, and even government officials/politicians from other ministries?

Although it is clear that these questions have no single answer, the radiation protection community is working towards a better understanding of the decision processes that have been accepted by stakeholders, and towards a clearer understanding of the roles and responsibilities of the various stakeholders in these processes.

The radiation protection system has evolved over the years. The photos here show workers in the 1970s checking for release of toxic material during cutting-up operations on steelwork, and sampling firebrick from a demolished furnace at Harwell in the United Kingdom.



UKAEA, United Kingdom


National Radiation Protection Board, United Kingdom

Measuring radiation levels near a thickness gauge in a paper mill.

The process of stakeholder involvement

There is widespread recognition within the radiation protection community, in a number of countries, that there are new, inclusive processes that enhance the way policy is developed and implemented. A striking feature of innovative, open and democratic examples of stakeholder involvement in decision making is, however, the extent to which approaches have been developed by and large in an ad hoc manner in response to the needs of a given situation. At a workshop organised by the NEA on "Better Integration of Radiation Protection in Modern Society", the various approaches that were presented could be characterised as having been largely successful as a result of the commitment of all the stakeholders to the various processes. Beyond that, some of the key factors of "success" identified were that policy and its implementation must:

- develop context-specific approaches;
- include guiding principles for the development of innovative approaches;
- involve representation from all perspectives on the issue;
- clarify the roles of all stakeholders in decision-making processes;
- foster a better understanding, among stakeholders, of the nature of scientific rationale;
- foster mutual trust, and a mutual learning attitude among stakeholders; and
- adopt an explicitly learning orientation.

Policy-level implications

The need to make distinctions between the scientifically calculated and the publicly accepted aspects of risk has implications at the international and national levels. These distinctions imply that many situations must be resolved in a case-by-case fashion, and as such, international recommendations must be flexible enough to give governments and regulators the latitude to develop national regulation that can appropriately address local situations. At the same time, governments need internationally agreed-upon criteria such that a homogeneous approach can be taken to issues with international implications.

This international level of agreement is represented by the system of radiation protection as recommended by the International Commission on Radiological Protection (ICRP). Since its inception in 1928, the ICRP has periodically issued "general" recommendations that describe how the public and workers should be protected from the harmful effects of ionising radiation. Its latest recommendations, ICRP Publication 60, were issued in 1990, but the ICRP is currently working on the development of a new set of recommendations due to be published towards 2005.

ICRP Publication 60 recommendations currently provide a somewhat classical approach to radiation protection. Numerical dose limits for the public and for workers are recommended, as well as various other numerical criteria. In the light of societal interest in participation, however, the selection of such numerical criteria should really

A member of the environmental team from the IAEA International Chernobyl Assessment Project collecting vegetable samples at Trakovichi, Ukraine.


Vadim Mouchkin, IAEA, Vienna, Austria

Energy Resources of Australia Ltd.

Measuring levels of radon gas in the atmosphere at a uranium mine.

be based on consensus among the stakeholders, not only on science. But practically speaking, governments have broadly expressed their satisfaction with the dose limits recommended by the ICRP, noting that international technical (or scientific) consensus on such numbers is increasingly useful, particularly because of globalisation and increased worker and public mobility.

On the other hand, other numerical guidance, most notably that related to criteria for the release of sites and materials from radiological regulatory control, has been more socially controversial. As pointed out above, it is increasingly recognised that flexibility is needed when addressing local situations and local stakeholder views and needs. As such, discussions are ongoing regarding how international recommendations should be developed to allow the desired flexibility.

At the national level, this flexibility will most likely find its way into laws and regulations. This may take the form of guidance with regard to, for example, numerical levels above which activities such as unrestricted site and materials release will not be allowed, but below which some sort of optimisation process is required. In addition, in recognition of the need for stakeholder involvement in the decision-making process, the approach to optimisation may be defined so as to require some level of consultation. Again, approaches are currently being studied at the national and international levels.

The NEA contribution

The NEA Committee on Radiation Protection and Public Health (CRPPH) is working towards building consensus on a way forward in both the areas of international radiation protection recommendations and approaches to stakeholder involvement. In 2000 it published a report entitled *A Critical Review of the System of Radiation Protection: First Reflections of the CRPPH*. This work identified several areas in which the current system of radiation protection should be reviewed and improved, and provided guidance with respect to directions that might be further explored. A more detailed proposal has since been developed, prioritising the areas identified in the previous report, and providing specific suggestions for improvement. This second report on the modernisation of the system of radiation protection will be published in early 2002. In addition, to show whether the suggested changes do "more good than harm", and would genuinely improve the current system, a series of case studies will be developed to "road test" the new suggestions. A workshop in late 2002 will be organised to audition these ideas and to present road-test results. The conclusions, representing regulatory and operational consensus within NEA Member countries, will be offered to the ICRP for consideration in its development of new recommendations.

Progress has also been made in the area of stakeholder involvement and has been documented in the Committee's 1994 Collective Opinion *Radiation Protection Today and Tomorrow*, the proceedings of the workshop on *The Societal Aspects of Decision Making in Complex Radiological Situations* (OECD, 1998) and of another workshop on *Better Integration of Radiation Protection in Modern Society* (OECD, 2001). Material developed during these workshops, which were held in Villigen, Switzerland, will be used as a source from which to draw policy lessons and implications, as well as practical examples of good practice. Because cultural differences are so important to the stakeholder involvement process, a regional approach will be taken to catalogue good practice, focusing on North America, Europe and Asia. Based on this, a third workshop will be organised in the 2003 time frame. ■