

# Public understanding of radioactive waste management issues: Perspectives and the IAEA's role

*Bringing technical facts and solutions to public attention may require greater global initiatives*

by K.T. Thomas and D.J. Squires

Nuclear energy development is at the crossroads and, in fact, has been so for many years now. The industry is in a dilemma because of the changed public attitude over the years on the nuclear issue. Five divergent views affecting public opinion can be identified, namely wholly negative, negative, middle, partially positive, and positive. Any worthwhile debate on this issue has to objectively assess these divergent views.

The dilemma of the nuclear industry is a travesty of facts and difficult to fathom. This comparatively new technology has brought many benefits, not only for power production but in the applications of isotopes. Moreover, new safety culture has been brought into our industrial way of life. The technologies are well proven and have established an excellent safety record. The economics of nuclear power (in spite of all the additional built-in safety features) can be compared favourably with any alternate energy systems, if the same basic assumptions for comparisons are used. The number of deaths and effects calculated to have been caused to people as a result of normal nuclear operations, incidents, and accidents have been far below those from other human industrial endeavours. (*See accompanying table.*) The nuclear industry's safety record is continually improving. It is quite possible that safer reactor systems will be operable in the not-too-distant future. Another major advantage of nuclear power is that it is much less polluting than conventional energy sources. And lastly, nuclear energy is the only available new technological source of energy. Developing countries are seeking new energy sources and nuclear power can play an important role.

Yet with all the above advantages, the growth of the nuclear industry is hampered.

Why? The reasons can be summarized in two words: "radioactive phobia". Everything connected with radioactivity has a different measure of judgement in the

people's minds. The safety of operating nuclear facilities and the associated health risks are uppermost in people's minds, especially after the nuclear plant accidents at Three Mile Island and Chernobyl. Of equal concern is the question of the safety of waste disposal.

This paper will address the waste disposal issue as it is one of the important ones being raised concerning acceptance of nuclear power. In a discussion of this issue two facts have to be recognized. The first is that wastes already exist in all countries having nuclear programmes and require safe management and disposal. The second is that adequate technology exists for doing this.

The technology for radioactive waste management was developed right from the beginning of the nuclear industry, unlike the case for some other conventional industries. The quantities of nuclear wastes are small, especially high-level wastes, when compared with conventional wastes. The radiation doses which can be expected from waste disposal are trivial when compared with those from natural sources of radiation and the effects of radioactive fallout. Analyses show that the health risks to existing and future populations are acceptable and far below those from alternative sources available for energy production. All energy fuel cycles produce wastes; however, nuclear waste disposal is less polluting compared to other produced wastes.

Specialists in radioactive waste management, among others in the nuclear industry, have been explaining to the public and the media their views on the subject. What are the results? Do the dialogues have a chance, or is it only a "dialogue of the deaf"? Is it futile to try to reconcile the polarized views on this issue?

The group which takes an uncompromising opposition with set minds on the subject consists of the hard core moralists, those with vested interests, the genuine doubters, and those who are disaffected by a technological society. This is a heterogeneous range of personalities who will not change their minds by any rational discussion. Is it necessary to continue dialogues with such groups and give them a platform without which

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Messrs Thomas and Squires are staff members in the IAEA's Division of Nuclear Fuel Cycle and Waste Management.

## Features

### Major industrial disasters — Comparison of Health Effects and Damages

Incident	Date	Nature of occurrence	Fatalities		Physical injuries		Mental injuries	Disruption of people's way of life	Environmental damage	Financial loss £ millions (1987)	
			Immediate	Delayed	Disabled	Total				Property damage	Other
Oppau, Germany	21/9/21	About 3000 tonnes of ammonium nitrate exploded	561 (up to 7 km away)	?	100?	1500	Severe shock over 10 km radius	7000 homeless. Relief fund exceeded £30 million		10-20?	?
Cleveland, USA	20/10/44	Conflagration involving about 3000 tonnes liquified natural gas (LNG)	128		?	200-400	Severe local shock. Public anxiety led to abandonment of LNG technology in US for 20 years	80 houses destroyed		ca 20	?
Ludwigshafen, Germany	28/7/48	Vapour cloud explosion	207		500 serious	3818	Severe local shock	Relief fund exceeded £7 million		?	?
Aberfan, UK	21/10/66	Landslide of coal waste buried school and houses	147, 116 children)	Nil		?	Extremely severe local shock. Prolonged anxiety	Relief fund exceeded £9 million		1?	
Seveso, Italy	10/7/76	Runaway reaction discharged tonnes of highly caustic material containing dioxin	Nil	Nil	Nil	447 burns 187 chloracne	Severe communal shock. Prolonged anxiety	737 long-term evacuations costing £1 million	Severe environmental damage over 4 km. Thousands of livestock killed, mostly by slaughter	20?	?
Three Mile Island, USA	28/3/79	Nuclear reactor malfunction	Nil	1-2?		Nil	Severe communal shock. Prolonged anxiety. Panic?	Thousands evacuated	Nil	1000	?
Mississauga, Canada	11/11/79	Chlorine release from train crash	Nil			Nil	Serious local anxiety	240 000 evacuated for up to a week from 125 km <sup>2</sup>		< 1-0	20? (loss of livelihood)
Mexico City, Mexico	19/11/84	18h conflagration of about 6000 tonnes of liquified petroleum gas (LPG)	> 500	?	100?	7097	Severe shock and panic	39 000 homeless or evacuated. Hundreds of homes destroyed		> 13	?
Bhopal, India	3/12/84	Runaway reaction in store tank released about 30 tonnes of methyl isocyanate	> 2000	??	??	200 000	Extreme shock and panic. Prolonged and extreme anxiety	??		100?	?
Chernobyl, USSR	26/4/86	Catastrophic malfunction of nuclear reactor	31	500?	7	237	Severe and widespread anxiety throughout Europe	112 000 evacuated on long-term basis. Relief funds exceeded £1000 million	Severe radioactive contamination of 10 km <sup>2</sup> . Remedial measures cost about £500 million	1500 to 2000	?
Basle, Switzerland	1/11/86	Chemical warehouse fire led to river pollution	Nil	Nil	Nil	Nil	Loss of public confidence in company		Severe damage to flora and fauna in 250 km of Rhine. Some short-lived atmospheric pollution	20?	?

Source: *Atom*, February 1988.

£ = British pounds.

they have a propensity for impairing their credibility? Maybe not.

Proponents and opponents have been listening to each other, but only what they want to hear based on selective listening, tuning out completely what they do not want to hear, see, or listen. Selective listening is not the basis for constructive dialogue or for conflict resolution.

However, such extreme "die-hard" opposition is only a small percentage, maybe less than 5%, leaving a large majority of apathetic and open-minded people. This is the segment on which most communication strategists would focus their efforts to instill a correct public understanding of the issues involved in radioactive waste management. The IAEA's activities are directed towards assisting national authorities in this task.

### **IAEA activities**

Public understanding is the key to public acceptance, and communication to the right audience is the all important bridge between the two. To achieve this, it is necessary to translate and communicate the technical solutions in an understandable way to the public and provide an opportunity to interested individuals and groups to give their views.

The social and ethical issues involved and public acceptance of the technical solutions developed for the safe management of radioactive wastes are important areas needing wider discussion and dissemination of information. The credibility of the technical community is increasingly being questioned by the public, media, and some political groups. To counteract this, there is a growing consensus in the technical community that clear, honest, credible, and understandable information must be made available to the public and media regarding the real situation of the safety of radioactive waste management operations. This is considered a prerequisite for further development of nuclear power and enhanced applications of radioisotopes for medical, research, industrial, and other uses.

In view of the interest shown by Member States, it has been increasingly realized that the IAEA should have a programme addressing the question of public understanding of radioactive waste management issues. Since the national strategies related to public understanding are mostly specific to an individual country's background, the IAEA's activities can only serve a supporting role to meet the needs of the Member States.

The Agency's programmes and actions, started in 1987, are based on three broad areas: (1) analysis of issues and identification of gaps in public understanding; (2) consultation with Member States; and (3) development of action strategies.

**Source book.** A senior consultants' group which met in 1987 recommended a number of Agency activities. An important one was the preparation of a source book that gives pertinent information on radioactive waste

management to help national authorities in the development of their national strategies for public acceptance.

The topics to be covered in the source book, include types of wastes; protection goals; radioactive waste management procedures; evaluation of methodology for long-term assessment of waste disposal systems; sociopolitical and ethical concerns; institutional aspects; and public acceptance strategies.

The book is being prepared to give experts on waste disposal and public information a source of materials on the technical aspects of radioactive waste disposal and techniques for increasing public understanding as a means for dealing with the technical and sociopolitical aspects of the issue. An effective source book and public information system can only be obtained by close interaction of the technical specialists in radioactive waste disposal and public information. Because of the book's potential usefulness, its production is being expedited, and issuance in 1990 is expected.

**National experiences.** An advisory group met in 1989 for a broad range of discussions on topics concerning public understanding of radioactive waste management and disposal issues. Drawing on national experiences, the group advised the Agency on its current and proposed activities in the field.

National communication strategies have not yielded the expected beneficial results; there have been some successes and many failures. Some countries have extensive programmes; yet in others they are modest. Diverse methods are adopted, such as preparation of video films and various types of publications, facility visits, etc. Establishing direct contacts with the public at local and national levels is another means adopted. The advisory group members identified a number of important lessons learned from national experiences.

One lesson is the importance and necessity of setting clear goals in public affairs programmes, and to measure progress towards those goals. The public information programmes should begin as early as possible taking into account sociopolitical issues.

Waste management decisions should be anticipated without being too optimistic about early resolution of problems which may be encountered. The process for selecting waste disposal sites should not be pushed unduly. It should be recognized that certain groups are already so firmly committed for or against siting, treatment, or disposal that further discussion with them is ineffective. Efforts should be made to work more closely with the groups that are most affected and with local opinion leaders, and to be an active member of the community and a physical presence at the site. Errors in judgement, if any, should be admitted, and understandings revised accordingly, of the site selection processes taking place. If an existing research and development site is utilized, national authorities should be sensitive to fears that the work is changing from advanced scientific research to mundane cleanup activities. It would be advantageous to look for allies among important com-

munity groups prior to a course of action. It is important to have trained technical leaders who can interact with the media as the spokespersons. The public should be invited to visit sites.

### Scope of the IAEA's future work

Based on recommendations it has received, the IAEA is continuing to assess the role it should play in public information activities. Areas of possible activity may include greater involvement with public information specialists in the member countries and provide them, if they so desire, with specially prepared materials. The Agency can provide such information directly to journalists, environmentalists, and elected officials with international and/or broad national constituencies. Joint publication of public information documents with other United Nations agencies, particularly the World Health Organization, would add further legitimacy to the Agency's documents.

*Near-term possibilities.* Some of the information in the source book could be expanded and be a basis for separate, easily understood booklets on specific themes, such as disposal; methodology for long-term assessment; comparison of risks of disposal with other human activities; high-level waste management; low- and intermediate-level waste management; IAEA guidelines and standards; and management of uranium mine and milling wastes. The contents could then be adapted, translated, and issued by Member States.

The Agency could also ask social scientists for a list of research and development activities within their fields that would have relevance to waste management questions. Production of films, videos, pamphlets, leaflets, and brochures which cover various aspects of waste management directed towards school children, profes-

sional, scientific, and other elite groups, as well as non-technical/scientific audiences, is another area that should be given more consideration.

A small group of respected journalists could be invited to meet with the IAEA and a selection of national information specialists to develop a seminar format for other less well-informed journalists. A similar expert group may be formed to develop guidelines for a series of briefings for medical associations.

The Agency could further identify international groups of opinion leaders for visits to facilities to supplement the activities of national agencies.

*Far-term possibilities.* The IAEA may investigate how to put in perspective legitimate scientific controversy on waste disposal matters. The Agency may explore the possibilities of a technically sophisticated television series (analogous to the "Living Planet" series in the United Kingdom) on topics of concern.

It was proposed that the Agency could look ahead beyond the year 2000 and produce an imaginative film covering the scenario on radioactive waste management that would prevail at that point of time. This may include details on deep repositories, underground laboratories, and decommissioning aspects.

### Follow-up actions

The recommendations given by the senior consultants and advisory groups, and the possibilities for IAEA initiatives, are extensive and will be considered within the context of the Agency's programme and human and financial resources. The IAEA's involvement will be based on a careful selection of what it can and should do to be optimally effective to the needs of Member States. It is hoped that the future initiatives in this important field will be of benefit to all Member States.

