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Public Perceptions in a Changing World

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Introduction

Dispelling misconceptions that surround the nuclear industry and the transport of radioactive materials is a constant challenge facing industry. Despite the industry's outstanding record of safety, events in recent years, most notably the tragic events of September 11 2001, have increased media, government and public scrutiny of the nuclear industry in general and of transport in particular.

These events have occurred against a background of changing perceptions of the role and integrity of scientists and 'experts', especially those employed by industry, and a redefining of the relationship between 'authority' and 'citizens' in most developed countries.

Within the wider political context, this paper considers the extent to which public perceptions have changed over time, and how they might be expected to change in the future. It examines the factors that influence public perception of risks and benefits, and relates this to the radioactive materials transport sector. The societal context of risk is also discussed and the important role it plays in influencing public opinion.

The growing importance of individual rights

The way society views ethical and environmental issues has changed since the early days of the nuclear industry. In the period immediately after World War II (and indeed before) politicians, scientists, industrialists and society at large tended to follow a broadly utilitarian ethic. Perhaps especially because of the experience of war (or other major societal stress such as economic depression), in which individual needs had to be subsumed to a major degree, the guiding principle for decision makers was a utilitarian one; the right (or best) course of action was one which would lead to the most beneficial outcome for the greatest number of people.

As time has passed, however, the so-called utilitarian ethic has been challenged by a more rights-based ethical standpoint. In this framework, individuals, and indeed by extension local communities are regarded as having 'rights' which are to a greater or lesser degree inviolable.

This change has been accompanied by a broad decline in 'deference' towards politicians and other members of the old 'establishment' (including scientists, or at least those working for large corporations), a growth in single-issue politics at the expense of the traditional political parties, resort to the courts to protect personal rights, a focus on the individual case study as a way of driving policy rather than a statistical approach to judging outcomes, and increasing use of direct action as a way of achieving personal goals. This being said, significant differences prevail among various countries depending on political culture or perhaps even 'national character'.

Implications for transport of radioactive materials

Some differences between these two ethical standpoints, as they refer to the issue of radioactive waste transport and indeed nuclear power more widely, can be listed as follows [(1)]:

Utilitarian Approach	'Contract' or 'Rights-based' Approach
Basic positions	
What is right is what promotes the best consequences for the largest number of people.	All people (individually and collectively) have rights to protection from risk – any risk is justified only with individual consent, compensation and equality of risk distribution.
Are risks ethically acceptable if they are at the same level as voluntarily chosen risks?	
Yes – the public should be consistent and accept risks that are lower than e.g. road fatalities. Risks have to be weighed against benefits. 'Natural [existing] standards' are used as a basis in determining the safe level of other pollutants, and should also be used for radiation. Risks are quantitative and thus comparable.	No – it is not just a question of perceived risk magnitude, but also of distribution and compensation. Assuming a level of risk is ethically acceptable because it is 'normal' commits the naturalistic fallacy; we cannot derive 'ought to be' from 'is'. Risk is a function of qualitative components such as the degree of consent of individuals who may potentially be affected, so comparing risks is a complex matter.
Uncertainty and ethical standards: should those who impose risk be presumed innocent until proven guilty, or the opposite?	
Should follow rule of maximising average expected benefit. Worst cases are very rare; minimising the risk of their occurring or their consequences impedes providing benefits. The burden of proof should lie with those claiming that a particular activity carries risks.	Should follow rule of avoiding the worst possible outcome. A small (close to zero) probability of catastrophe does not outweigh consequences which are perceived to be extremely severe. The burden of proof should lie with those claiming an activity is safe.
Equity Issues	
Prepared to accept that the effects on all people (not just those living in the same country) are important, but believe that risks to future generations can be discounted to some degree. Poor communities that accept risks do so voluntarily – economic development benefits and wage differentials compensate for the risks to workers.	Temporal and spatial considerations are not a morally relevant basis for discriminating in imposition of risks, in particular, potential effects on people in the future should be regarded with the same seriousness as effects on people alive today. It is unfair to burden these communities disproportionately. Economic welfare does not justify such inequalities, as the human right to equal protection is inviolable.

Public perception of risks

'Who is saying' something and 'how they are saying it' are closely connected. If the people seeking to establish the nuclear transport industry's key messages seem in some important way distant from the audience, because of who they are, how they act or both, communication can easily become counterproductive. Non-verbal impressions have profound consequences on whether the intended audience is prepared to listen to what is being said or whether they simply reject it.

It has been suggested that it is important to reduce the level of 'emotion' in the nuclear debate. However, there is a contrary view - that to remove 'emotion' from the debate may, in fact, create a barrier between the communicator and their audience. After all, we live most of our lives in an emotional way, and the more the nuclear industry portrays itself as being different from society as a whole, the higher the likelihood that trust, based on empathy and shared values, could be undermined.

It is striking that several issues in society which involve the interface between science and politics present a very similar profile. Examples include mobile phone masts, genetically modified organisms, road building, the development and use of certain vaccines. This would seem to suggest that the real dispute, at least to some extent, is not about the particular aspects of the issue in question but about wider societal issues such as the equitable distribution of risk, the balance between benefit and risk, local autonomy and 'who decides'.

How do we make our minds up?

As noted above, risk is increasingly judged in a societal context – for example, the argument that 'you choose to run far greater risks than those associated with transport of radioactive materials so you should not worry about those risks so much' increasingly receives the response that I have a right to run whatever risks I like but no degree of risk imposed on me without my permission is acceptable.

The public does not necessarily interpret 'risk' in the same way as the 'experts'. In one study, individuals were asked to respond to two identical lists of activities, and to rank them with respect to two questions – 'which of the following do you consider to be the most risky?' and 'which of the following do you associate with the highest probability of premature death?'[(2)]. Different activities were mentioned most frequently in the two cases, implying that when we refer to an activity as 'risky' we refer to more than simply its potential for causing death.

perceived as less serious than one which is imposed on people and is difficult to control. The third concerns the number of people affected by the risk; if a risk represents a small chance of damage to a large number of people (especially future generations), it will be perceived as more serious than a risk which has the same overall health effect, but where one can identify the likely victims.

Car travel, responsible for several thousand deaths each year in a country like the UK, lies near one extreme of all three factors. We are all familiar with car travel, having (by definition) taken part in this activity without suffering a fatal accident. Finally, although there are many deaths on the roads, it is always possible to identify the victims, relatively few such fatalities are reported in the mass media and there is no apparent risk to future generations.

Radioactive materials transport appears at the other extreme. It is seen as being associated with a relatively new activity (nuclear energy) and therefore perceived as

"Which of the following do you consider to be the most risky?"	**'Which of the following do you associate with the highest probability of premature death?'**
Nuclear power	**Smoking**
Genetically modified food	**Alcohol**
Food additives	**Car accidents**
Car accidents	Air pollution
Weapons	Bad diet/lack of exercise
Smoking	Weapons
Alcohol	Pesticides
Aircraft accidents	Aircraft accidents
Skiing	Nuclear power
Pesticides	Skiing
Radon	Food additives
Air pollution	Radon

Note: Bold text indicates hazards drawing a statistically higher response rate than the others.

There are two possible ways of explaining such observations. It may be that some aspect of particular risks leads people to feel more uncomfortable about them than others, given the same likelihood of causing harm. Alternatively, there may be something about the social context of certain risks – for example, a particular mistrust in the individuals associated with the activity – which may lead to people regarding the activity as 'risky,' even when they are aware that it is unlikely to be associated with direct harm.

Three factors seem to be in play in forming our perceptions of the importance of various risks [(3)]. The first is associated with familiarity; if a risk is an old, well-established one, familiar to the individual and easily detectable by unaided human senses, it will tend to be underestimated compared to a risk of the same actual magnitude which is new, unfamiliar and difficult to detect. The second concerns controllability; if a risk is run voluntarily and is easy to control, it will be

a new risk. Radiation is not detectable by unaided human senses and it is easy to portray nuclear transport in a negative context, the mass media generally preferring 'bad news' stories to good ones.

There is no question that an incident in the nuclear industry could trigger a lasting negative change of opinion. Well-publicised accidents such as Three Mile Island (1979), and Chernobyl have added to public unease. Even the smallest incident, no matter the lack of any real or potential radiological consequences has the potential to play to people's latent fears. This mistrust affects operations such as transport even where that sector has an excellent record of safety.

The terrorist attacks of September 2001 in the USA have added a new dimension to the debate. Even before 2001 opponents of nuclear transport would use phrases like 'a floating Chernobyl' to describe shipments of radioactive materials [(4)].

In addition, perceptions of benefit are relevant to our perceptions of risk. In the case of car travel, the benefit – a convenient and private journey – is delivered immediately, while rail travel involves our having to get to and from the station and depends on the train running on time. There may therefore be something of a psychological 'vested interest' in underestimating any associated risks. The perceptual link between transporting radioactive materials and electricity coming from a wall socket is somewhat esoteric by comparison, as are the claimed benefits in terms of, say, reducing climate change.

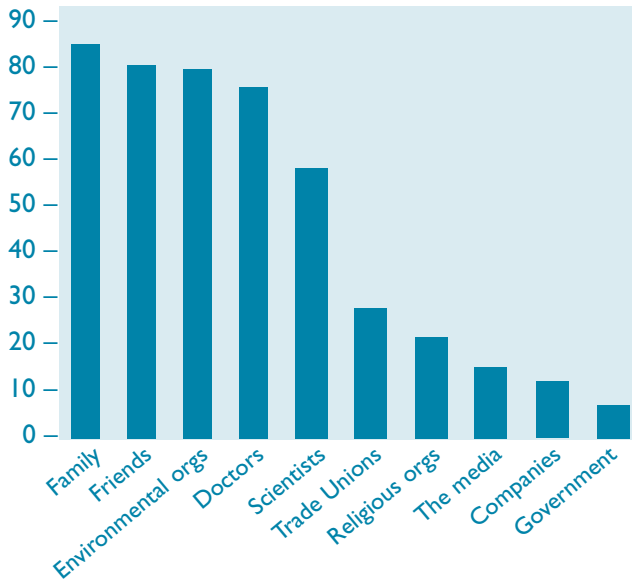
This has important implications for industry communicators. If an activity has no obvious benefit, either in a wide sense or more directly for those most affected by it, then whatever the level of risk involved, such risk is likely to be regarded as unacceptable. If an activity – say the transport of radioactive materials – is not put into the wider context of the benefits of the processes through which those materials were created, it is likely that building public acceptance will be more difficult.

The social context of risk

In addition to the above, factors such as the way in which 'information' is disseminated, and the apparent motivation of those giving the information, are also of importance.

It is undeniable that some of the issues in the nuclear field are so technical as to be inaccessible to non-specialists. Furthermore, 'experts' – people who clearly understand the field in great detail sometimes disagree, publicly, about certain aspects of the technology.

Percentage of respondents often or always trusting different institutions to tell the truth [5]



When people seek to make up their minds about the desirability or otherwise of nuclear energy and associated issues such as the transport of radioactive materials, the credibility that they accord the source of the information becomes a very important issue. At present it seems that people are more likely to believe statements by scientists working for environmental organisations, for example, than scientists working within industry or government.

It would be difficult and mistaken to under-estimate the importance of public attitudes to radioactive materials transport. The transport industry takes its responsibilities seriously, commensurate with the equal necessity to ensure security of transport. The appropriate balance between openness and security requirements according to international agreements must be struck.

The communicator must engender trust. The communicator must provide reliable knowledge, empirically based and rigorously proven. Facts must be presented that take account of the wider context, and in ways that are meaningful by being seen to respond to the wider public's interests. The nuclear transport industry today must communicate effectively while fully honouring its commitments and requirements for safe and secure transport.

Industry's response

The nuclear transport industry has become increasingly aware of the importance of developing communication strategies to show regulators, local governments, local communities, and the media what measures have been taken to ensure safety of shipments of various kinds. Many tools have been deployed – publications, videos, media briefings, websites, visits to nuclear facilities – to discuss the issue in a more open way with key opinion-formers such as local authorities, the media and local businesses and industries. One example of such activity is the series of 'information missions' carried out by states which ship nuclear materials in order to inform 'coastal states' (countries which gain no direct benefit from the shipments but may perceive potential risks). These missions are of two kinds; 'diplomatic missions', which seek to provide information for government officials and political authorities; and 'media missions' which interact with the general public, through the media [6]. The programme has included visits to South Africa, Australia, New Zealand, Fiji, Panama, Brazil, Chile, Uruguay, Argentina, Caribbean states and other countries of the Pacific Island Forum.

Another initiative has been to bring the transport sector into the International Nuclear Event Scale (INES) designed to provide an easily accessible way of measuring and communicating the implications of a nuclear incident [7].

The application of INES Scale to transport operations is now being developed in a number of countries and experience in its use is being built up. Its introduction provides the means for national authorities to communicate promptly with the public and the media in consistent and clear terms about the safety implication of any events involving the transport of radioactive materials.

International Nuclear Event Scale (INES)

Accident	7	Major accident
	6	Serious accident
	5	Accident with off-site risk
	4	Accident without significant off-site risk
Incident	3	Serious incident
	2	Incident
	1	Anomaly
Deviation	0	Below scale – no safety significance

Events are classified on the scale at seven levels. The lower levels (1-3) are termed 'incidents' and the upper levels (4-7) 'accidents'. Events are considered in terms of three safety attributes or criteria: off-site impact, on-site impact and the extent to which 'defence in depth' has been degraded (a measure of how close the accident was to becoming more serious in its effects).

However, there is an inevitable tension between transparency and the requirements for security. The nagging question will continue to be raised by the industry's opponents: if these shipments are indeed as safe as the industry claims because of the physical measures being taken, why is secrecy and security such an obsession. This issue, if not handled carefully, can undermine genuine attempts to increase the mutual trust between the various involved parties.

The way forward?

The content of communication – 'what is being said' – of course remains important. New issues arise all the time, especially since September 11, 2001. The observation that safety standards have been based around the strength of the packaging rather than the protection afforded by the transport vehicle itself is a useful one [8]. However, equally important are issues associated with the way the message is presented, and indeed who is doing the presentation.

Public perception of risk is to some extent associated with the wider societal issues such as equitable distribution of risk, and the balance between risk and benefit. Strengthening the perceptual link between transporting radioactive materials and, say, the benefits of electricity generation may enhance industry's public acceptance.

An examination of changing ethical approaches in society seems to indicate that the best response available to the transport industry, in face of a rights-based ethic, is to further develop an open approach to concerned third parties. This would involve provision of sufficient levels of information to all who ask, and a genuine dialogue with affected states and communities to find ways of lessening their concerns. A key outcome of such a programme should be to build trust between the industry and those whose acceptance of its activities is important.

Communication will be most credible if its source is seen to be open, accountable, inclusive and equitable. In those countries in which public opinion is broadly accepting of developments in the nuclear energy field (including the transport of materials necessary to underpin the industry), it seems that governments and industry have been particularly effective in building a genuine dialogue of trust between the various interested parties.

If this approach is to be followed, the industry must be prepared to directly address the more challenging public concerns about its activities. There must be attempts to involve all relevant stakeholders and to understand their particular concerns and information needs.

There is evidence that the nuclear industry has recognised the importance of becoming a genuine partner in decision-making with other stakeholders and with society at large, and including in the consultative process representatives of a wider range of interests than was previously the case. Nonetheless, it may take some time before the change is accepted by elements of the public, media and political establishment.

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