I R P A 10

TOPICAL SESSIONS
Reports of Co-Chairmen for Highlight Sessions

T-15: Communication with the Public: Radiation Risk Perception in Context

Wednesday, 17 May 2000

Chair and Keynote: S. Pretre Co-Chair: F. Steinhaeusler

Ideally facts should have priority over symbols in our decision making process and communication (e. g. in science), but often the opposite is the case (e. g. in religion or politics), in other words: “the dry world of facts is in opposition to the sea of symbols” (Aldous Huxley, 1954). Reviewing the stages of ***domestication of nuclear energy***, it was found that the exaggerated confidence in technical progress of the 1950’s, coupled with a nuclear elite increasingly introducing secrecy, was gradually replaced by a declining trust in science [1]. Subsequently democratization of knowledge does not take place on a significant level and 50 years later the situation is basically still blocked. However, increased emphasis on globalization, deregulation, total competition and quality assurance provoke also the democratization of nuclear knowledge. PRETRE foresees that these developments may have a potentially significant impact on the image of nuclear energy and the role for radiation protection in the future:

1. If nuclear energy is really safe and a viable option, it will survive; otherwise it will disappear;
2. If nuclear business can be run as a common business by common people, it will gain sympathy.
3. Radiation protection might become more common, less paternalistic and might eventually even be integrated into other professions.

Currently communication of radiation-related risk issues with the public is frequently lacking success. Taking into account recent developments in terms of ***risk governance*** two paradigma emerge [2]:

1. The *top-down paradigm* , characterized by the dominant role of the public authorities in the risk assessment and management process, as well as in the justification of hazardous activities. Scientific trade-offs, residual risks, or conflicts of interest are usually kept undisclosed to the public. Although efficient for the governance of most risk activities, this model appears to be no longer effective in contexts where public confidence has been seriously eroded, contributing to social distrust.
2. The *mutual trust paradigm* , characterized by broad involvement of the stakeholders in the decision making process, including risk assessment as well as in the justification of the hazardous activities, In this model science is only *one* factor in the total process, allowing for collective- and individual concerns, as well as uncertainties and trade-offs to be revealed.

In terms of practical application the top down model seems relevant for the governance of radiological risk. However, the mutual trust model could be very useful to improve the management of exposure situations, such as releases from installations, radioactive waste management, and management of occupational exposure.

The special role played by nuclear energy in general and radiation protection in particular was reveiled in two recent ***public opinion surveys***.
Using the results of opinions expressed by Japanese adults from the general public and contrasting their opinion with that of Japanese nuclear researchers, it could be shown that [3]:

- The extent of public knowledge in various fields of science and technology is too poor (as compared to that of researchers) in order for them to discriminate individual risks and benefits associated with the use of these technologies
- A strong feeling of "risk" concerning nuclear technology - as compared to other technologies - is clearly dominant among members of the public
- News media gradually shape such negative feelings towards nuclear energy over the long term.

A similar study carried out in Brazil indicated the general need for the national authorities for intensified pro-active communication programmes [4]. For example, even in an area affected severely by a radiation accident in the past, 35% of the respondents were ignorant about the meaning of the trefoil as a sign for radiation; or: the acronym for the national nuclear regulatory authority was unfamiliar to more than half of the respondents, despite of its heavy involvement in the aftermath of the accident.

Internationally several efforts have been made to improve the dissatisfactory situation concerning the lack of success of nuclear-related communication programmes.
Practical application of ***risk cognition*** has shown promising results in understanding the process by which members of the public form their opinion about technology-related risks [4]. Contrary to the methodological approach used preferentially by regulatory agencies, i. the *quantified risk analysis,* members of the public typically follow three principles in the multi-stage process of evaluating the risk for complex technologies, such as nuclear technology or biotechnology. These principles are:, availability of recall, representative-ness, and personal risk adjustment. Only upon completion of this process will the individual compare the result of this *subjective risk evaluation* with the *objective scientific risk estimation.* In other words, quantitative risk analysis is only of limited use in communicating with the public, since it does not account for the personal judgement concerning the significance of hazardous events. Therefore the objective of an effective communication programme with the public should make every effort to synchronize between the subjective risk evaluation - occurring in an area of significant uncertainty – and the objective risk analysis by the scientific community. Such interaction should preferably occur at an early stage, aiming at the reduction of this area of uncertainty by:

- Identification of the different target audiences and their specific concerns
- Development of a coherent internal and external communication plan, applying modern opinion research methods

- Continuous quantification of the outreach of the communication programme, using performance indicators.

Another such effort aimed at improving communication with the public is the proposal of a ***Radiation Protection Scale*** [5]. This approach aims to overcome the frequently encountered problem of misunderstood radiation protection concepts and a confusing multiplicity of units. Furthermore, in this manner the inability of the public to differentiate between low, medium, and high doses and their potential implications would be overcome. It is proposed that a logarithmic basis for the Radiation Protection Scale will result in an easily understandable scale of integer numbers, ranging from 1 to 7 like the RICHTER-scale describing the magnitude of earth quakes. The proposed scale is defined in the following manner:

- Level 0 – 3: description of the dose range of miniscule doses below natural radiation exposure levels
- Level 4: dose range 1–10 mSv, i.e. equivalent to the dose range due to the natural radioactive environment
- Level 6–7: dose range 0.1-1 Sv , i.e. protective measures to reduce the dose are important, respectively mandatory to prevent significant detrimental effects for the individual concerned.

References (all papers published in the proceedings of this conference):

[1] T-15-1:
Pretre, S.,, Communication with the Public: radiation risk and perception in perspective”

[2] T-15-3
Schieber, C., Lochard, J., “ The social stakes associated with radiological risk management”

[3] T-15-4
Ohnishi, T., Tsujimoto, T.,, “ Why is the public acceptance so peculiar only for nuclear energy?”

[4] T-15-2
Steinhausler, F., Wieland, P., “ Risk cognition as a new communication tool for high-tech industries: comparative analysis between nuclear industry and biotechnology”

[5] T-15-5
Mueck, K. et al, “ A proposal for a radiation protection scale to better communication with the public”