

Facilitated Workshop Method to Involve Stakeholders and Public in Decision-making Process in Radiological Emergencies

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Abstract

International organisations in radiation protection have for many years recommended that key players, e.g. authorities, expert organisations, industry, producers of foodstuffs and even the public, should be involved in the planning of protective actions in case of a nuclear accident. In this work, we have developed and tested a facilitated workshop method where representatives from various fields of the society aim to identify and evaluate systematically protective actions. Decision analysis techniques have been applied in workshops in order to find out the most feasible countermeasure strategies and to make the decision making-process transparent and auditable. The work builds on case studies where it was assumed that a hypothetical accident had led to a release of considerable amounts of radionuclides and therefore various types of countermeasures should be considered. This paper provides experiences gained in several European countries on how to facilitate this kind of workshops and how modern decision analysis techniques can be applied in the decision-making process.

1. Introduction

In Europe, tools and systems have been developed to support the decision-making in nuclear or radiological emergencies. These systems are able to assess the so-called 'hard factors', e.g. radionuclide concentration in foodstuffs, radiation doses and dispersion prognosis. However, also the less tangible factors will affect the decision, especially in the later phases of a radiological emergency. These criteria or attributes can be related to public reassurance, equity, socio-psychological issues, concerns on livelihood, environmental issues, etc. Decision-makers need real support to handle the more measurable 'hard factors' and the 'soft values' at the same time and to make judgement on their relative importance in the given situation.

Openness, transparency and participation by the key players are all important factors for balanced decision-making on public issues. Decisions should be understood, accepted and supported by both the population and decision-makers. Research of stakeholder and public involvement into environmental decision-making has led to the conclusion that if the relevant parties are not engaged in the decision-making process the policy will fail [1] and [2]. International organisations in radiation protection have recognised the importance of prompt, open and transparent decision-making based on scientific facts and social judgement [3] and [4]. They have

emphasised that the basis for the decision must be perceived by the public, and all relevant factors concerning the decision should be considered in a rational manner.

The key players, e.g. authorities, expert organisations, industry, producers and the public or their representatives, may be engaged in the decision-making process in various ways. Current practices range from the form where interested parties are only informed of the decision taken, to the form where the public, based on a recommendation, makes the decision [1], [5], [6] and [7]. Individual participation methods have apparent advantages but some are also prone to shortcomings that have led to criticism [1], [5] and [8], e.g. the decision might not be accountable. The focus might be the public involvement itself, rather than a means to the results [6]. The working procedures and efficiency in the use of time in the group meetings have also often been considered poor [2] and [9]. Information could be in an unstructured form or not in the form needed in the decision-making process. The reported experience emphasises the importance of having relevant information, and clear procedures and methods for the decision-making process.

The facilitated workshop offers a participatory method which tries to include the concerns of all key players openly and equally in the decision taken. The approach employs a group process where responsibility is placed on participants to assimilate information and to provide judgements. The main characteristic difference is that it has a clear structure based on the decision analysis method. It provides a reasoning framework that intertwines the beliefs, preferences and value judgements of the key players and achieves a transparent ranking of the various strategies available.

Decision analysis techniques are not a new approach for solving societal problems. They have been applied to solve social and environmental decisions such as wastewater treatment and wilderness preservation problem [10] [11] and [12]. Marttunen and Hämäläinen [13] applied decision analysis as an individual interactive computer-supported interview method and involved a large number of stakeholders in two river development projects. The papers by Apostolakis and Pickett [14], Hämäläinen [15] and [16], Keeney and von Winterfelt [17] and Keeney [18] are examples of studies of problems which deal with clean-up of a hazardous waste site, energy policy of nuclear power and management of nuclear waste. In the field of nuclear emergency management, decision analysis has been applied and facilitated workshops have been organised in various countries [19], [20] and [21].

This paper reports how the workshop method has been applied in nuclear emergency management and summarizes the observations from facilitated workshops organised and co-ordinated by the authors in different countries. We discuss the pros and cons of the facilitated workshop method vis-à-vis the conventional approaches applied in nuclear emergency management.

2. Decision-making in Off-site Nuclear Emergencies

The planning and implementation of protective actions in case of a nuclear or radiological emergency involves co-operation of several authorities and expert organisations. The composition of the groups depends on the type of the emergency and also on the phase of the situation. For example, in a case of a severe nuclear power plant accident, there is a certain time - hours up to days - before any radionuclide releases to the environment take place. In this threat phase, decisions

are normally made by the operator and the local rescue officers, and the decisions are based on ‘best estimates’ concerning the development of the plant status. In later phases of an accident, also other organisations will be involved in decision-making and planning of countermeasures. The decision-making is subject to a country’s administrative and legal system where responsible administrators and organisations, politicians as well as representatives of the affected citizens will have an important role. The basic principle in nuclear emergency management in central government is that each branch of administration is responsible for preparedness arrangements, emergency responses and information on actions in their own sector of authority. Hence, each ministry decides on countermeasures in their sector of authority and presents matters to the Council of State in issues requiring political commitment. Various expert organisations on nuclear and other issues assist all administrative branches. The duties of expert organisations regarding off-site emergency management are inter alia: to assess the radiation situation, to assess and predict radiation-related health consequences and prepare recommendations. Hence, groups of various sizes and compositions, ranging from local emergency services through local government to central government bodies, participate in the decision-making process. The formal decision is typically made in the presentation of matters to the President, Governor or maybe, in a less formal way, to the Director General of Rescue Services. Figure 1 illustrates the development of population’s exposure to radiation after a release of radionuclides from the accident site and the bases for countermeasure decisions in different phases of an accident.

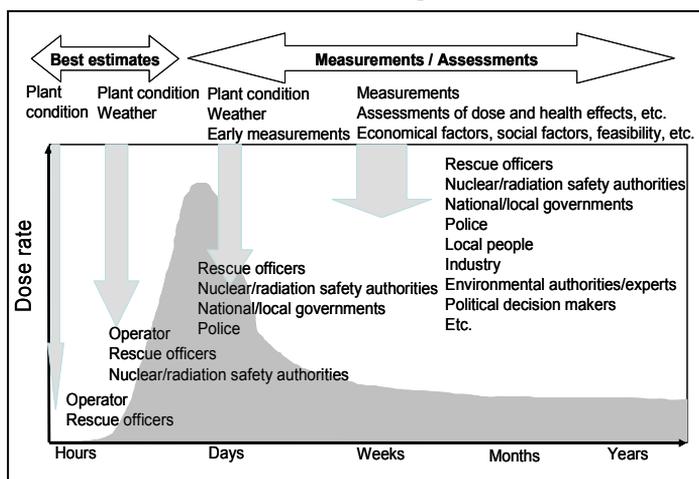


Figure 1. Bases for countermeasure decisions in different phases of a nuclear or radiological emergency. The grey area illustrates the integrated radiation dose without any countermeasures.

To be able to make the right decisions at the right time we have to know the people and organisations that are responsible for the decisions and the other stakeholders involved in decision-making, i.e. we have to know the whole emergency management process. Another requirement for proper emergency management is to have operational systems to trigger the emergency management and to collect

information on the emergency situation (emergency plans, monitoring systems, decision support systems). Furthermore, we should have methods to rank different countermeasure options in a way that the decisions are transparent and traceable (evaluation tools, decision analysis). Finally, because various stakeholders are involved in decision-making in different phases of the situation, we need methods to get input from all relevant stakeholders in a reasonable time (facilitated workshops).

3. Facilitated Workshop in Countermeasure Planning

A series of facilitated workshops have been organised in Europe to analyse protective actions and to develop methods for key player participation in case of a nuclear accident [22] and [23]. The workshops were jointly arranged by the Universities in Finland, Germany and the UK, and expert organisations in radiation protection in Belgium, Denmark, Finland, Germany, Norway, Poland, the Slovak Republic, Sweden and the UK between 1992 and 2003. The work has been funded by the Nordic co-operation organisation (NKS, Nordic Nuclear Safety Research) and the Framework Programmes of the EU. The expert organisations were responsible for the co-ordination, development of the accident scenarios, consequence assessments and for the contacts with the key players. Universities were responsible for the decision modelling and analysis approaches, and for the implementation of the decision support software as well as for the facilitation of the workshops. The objective of facilitated workshops was to evaluate systematically the protective action strategies in such a way that concerns and issues of all key players could be considered openly and taken into account equally in the decision.

The participants of the workshops represented the real decision-making authorities and organisations, such as ministries (Interior, Health, Agriculture, Environment, etc.), local and provincial officials, food industry, consumer services, police, rescue services, nuclear power companies, radiation and nuclear safety authorities, health authorities, food control, local inhabitants etc.

The planning of protective actions and the participatory method development was based on case studies where the key players were invited to consider a scenario of a hypothetical but realistic nuclear accident. It was assumed that a core-damage and containment leak accident had occurred at a nuclear power plant, leading to the contamination of the environment. It was also considered important that the current emergency management process of the administration was followed closely and that all the relevant players were represented at the meetings. Several protective actions and a bundle of actions, i.e. strategies were selected to be considered in the workshops. The first workshops focused on the early phase countermeasures, e.g. administration of iodine tablets, sheltering and evacuation. The later phase issues were analysed in the workshops, too: the relocation of the population, and to plan countermeasures to reduce the dose received from consumption of dairy products contaminated by radionuclides. The theme of the last set of workshops organised in various European countries was to find the best ranked countermeasure strategies to clean-up the contaminated inhabited areas.

Decision analysis has a major role in facilitated workshops. The aim of the multi attribute decision analysis is to facilitate stakeholders' understanding of the problem, each others' priorities, values and objectives, and guide them to identify the preferred actions. It is a learning process that generates recommendations for actions. It is not intended to be used to solve problems automatically. It is both an

approach and a set of techniques to rank options according to people's preferences. It guides discussions and offers a structured way to tackle the problem. An important feature is also that it allows participants to try different judgements to see the consequences without a final commitment. This allows them to re-evaluate their opinions. The essence of decision analysis is to break down a complicated decision into small, manageable pieces that can be dealt with individually and then recombined logically. The main phases in this one-step-at-a-time approach are: identification of relevant objectives (e.g. 'avoid radiation dose, 'reassure the public') and attributes that can be used to measure the success of a strategy in achieving the objective ('cancer cases', 'a subjective score of reassurance'), definition of action alternatives, assessment of the consequences in each action, judgement of the relative importance of consequences and analysis how sensitive the resulting ranking of actions is to changes in the values in consequence assessment and trade-off [24].

The facilitators role is important and demanding because a facilitated workshop is an interactive event. The facilitator is not a chairperson or a group leader. He/she should not share the problem but should concentrate on the process, not on the content which is left to the participants. The facilitator is a person raising issues neutrally and asking simple questions to ensure that all have understood the point. The attributes were discussed in all workshops extensively and it was interesting to note that the value trees have a very similar structure. The objective 'to avoid harmful health effects' (population and workers' radiation doses and physical risk in implementing countermeasures) was common in all workshops. Monetary cost of actions was not perceived to be an issue in the early phase of an accident. Funds were considered to be available from contingency provision and many actions turned to be relatively cheap in the later phase, too. Technical feasibility (available resources, waste management, etc.) was sometimes an attribute in the analysis and sometimes it was discussed but not used as a criterion in decision-making. Socio-psychological attributes (e.g. anxiety and disruption of the population) were important criteria in some scenarios but not decisive or influential in other situations. Social or political acceptability was an issue in many workshops and a criterion in decision-making. The composition of the group could have influenced the selection of attributes. In workshops where acceptability was an issue, the group consisted mainly of authorities. In workshops where local inhabitants or other provincial and producer representatives were present, acceptability did not emerge as an issue. Also, people having different backgrounds gave different weight on the consequences. For example, emergency management teams gave more weight on health consequences vis-à-vis. costs than representatives of the industry.

The mutual weights of the criteria understandably varied in workshops depending on the level of contamination being used in the scenario, the total fall-out area, resources available and the number of people affected. If the contamination and the consequent radiation doses were not high, social and political aspects had a greater weight than health related issues: on the other hand, if the contaminated area was wide, technical feasibility and costs had a greater importance.

4. Discussion

The experience gained strongly supports the format of a facilitated workshop for tackling a decision problem that concerns many different key players. The participants considered the workshop and the decision analysis very useful in

planning of actions in advance. They also expected a similar approach to be applicable in a real situation, although its suitability was not rated as high as for planning. The suitability of the approach in the early phase of an accident was rated the lowest. We conclude that a facilitated workshop is a valuable instrument for emergency management and in exercises in order to revise emergency plans or identify issues that need to be resolved.

Open and transparent societal decisions are required both by the public and the politicians [1] and [2]. One finding of the study is that transparency and communication could be clearly increased by applying the structured approach of decision analysis. Susskind and Field [2] have argued that face-to-face negotiations among the key players could be the only way to settle the acceptable level of risk. However, the active participation of all key players increases the cost and complexity of the process, and the decision when to stop an analysis has to be made by seeking a balance between elaborateness, time and the resources available. There is no need for an analytical, participatory approach in recurrent decisions. People are accustomed to routine decisions where experience is available. However, rare, complex problems such as large protective actions can benefit from the use of facilitated workshops based on decision analysis.

It is important to learn to see where in the decision-making process decision support in the form of a workshop would be appropriate. Facilitated workshops do not fit comfortably in the decision-making process applied commonly nowadays as a forum for making final decisions [25]. Preparation of a decision is divided into so many phases carried out by many responsible people that a single decision-making point cannot often be identified. In a workshop a single decision-making point is presupposed. Commonly, politicians and authorities do not participate in the consequence assessment or in the preparation or evaluation of a decision. They tend to wait, avoid the commitment to the outcome and take distance if possible [1]. They expect well-prepared advice from the experts [10] and [26]. Experience gained from this work supports the view that facilitated workshops fit well in the planning phase in a decision-making process where the key players with expertise in different areas evaluate the alternative policy options in an open discussions before the final, formal decision-making.

It was found important that the relevant expert organisations carry out the technical calculations and reports in such a way that the politicians and authorities are able to understand the scale of the problem and the consequences of the decision options. The information collected should be in a suitable form for decision-making as is described in the decision analysis. This helps communication and saves time. The aggregation of unstructured information could easily result in a collection of views which cannot be utilised in decision-making process.

Most participants were not familiar with this type of a structured approach based on decision analysis and opinions were divided but in general it was very well accepted by the participants. Some found that the benefits were obvious but some did not feel comfortable with the modelling tools and had problems in understanding the procedures such as weighting of attribute scales. The definition of the attributes and the countermeasures, and decision table were easily adopted. One reason why some were reluctant to decision analysis might be that they were expecting a recurrent decision-making process where experience is available. The method is novel and not earlier applied in radiation protection. In the future new applications of the approach

to appropriate problems are likely to increase acceptance and understanding of the techniques.

The facilitated workshop method could be very successful in improving the quality of decisions and resolving conflicts among competing interests of key players. One threat is that the participation of a small group tends to narrow down the incorporation of public values in the decision and the education and informing of the public [7]. Attention should be paid to the responsibility of participants to commit themselves into intensive communication to those whose spokesmen they are. The openness and transparency could also be increased by making the results of decision analysis available on the internet.

5. Conclusions

In the discussion we already pointed out that these kinds of facilitated workshops are of real value. The main benefits include an improved understanding of the real risks, policy alternatives and stakeholders' perceptions that are likely to emerge in a large nuclear accident. Our current group of participants represented a high level of both the governmental and the local authorities and stakeholders. Workshops like this help to create a shared vision of the risks, realistic countermeasure policies and preparedness needs.

The pros and cons of the facilitated workshop method can be compared with the conventional approaches, e.g. the stakeholder network method where the public is not involved. All participatory methods, when practiced in advance, improve the functions of a network of key players and result in better preparedness for accident situations. Facilitated workshops provide the participants with a forum for structured dialogue to discuss openly the values behind the decision. A stakeholder network can evaluate and augment countermeasures in general but protective actions are not evaluated systematically, openly and in depth, based on values.

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