

OFF-SITE RADIOLOGICAL EMERGENCY PLANNING JUSTIFICATION AND CO-ORDINATION

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INTRODUCTION

The nuclear power reactor accidents at Three Mile Island (TMI) (1979) and Chernobyl (1986) have influenced off-site emergency planning world-wide. Despite very limited environmental radiological consequences of the TMI accident and a limited need of response actions of the emergency organisation outside the plant, the accident caused a higher attention and new conditions regarding the bases for off-site emergency planning. After TMI in many countries more attention was also given to even more severe reactor accidents than so called 'design base accidents', i.e. accidents were now considered which could lead to emergency situations with large scale land contamination's.

The Chernobyl accident some years later made it quite clear that existing national emergency preparedness and international agreements were not sufficient to cope with an accident leading to a large scale radioactive contamination with an impact in several countries. There was an obvious lack of bilateral or multilateral agreements regarding early warning, preparations for exchange of information and measurement data, or shortcomings in existing agreements due to inadequate preparedness and training.

In response to the experience of these two accidents, the awareness and resource spending in the field of radiological emergency planning have increased nationally as well as within the various international organisations. Increased efforts were clearly necessary, and by and large they have improved emergency preparedness considerably.

However, we wish to raise the following questions:

- To what extent could the various planning measures be considered as justified from the radiation protection point of view? Are there instances where public opinions or even 'expert opinions' forced decision makers to take some actions which could be questioned?
- A lot of actions have been taken, and new ones can be expected in the future, to improve emergency preparedness in Central and Eastern Europe and the newly independent states of the former Soviet Union. Currently, there is a need for a co-ordination of all the various ongoing assistance activities, in order to avoid duplication of efforts and waste of limited resources. Which initiatives ought to be taken to make such activities as effective as possible?

1 EARLY NOTIFICATION OF A NUCLEAR ACCIDENT

The IAEA convention on early notification of a nuclear accident and information exchange has got a world-wide acceptance. A communication system for notification and information in case of a radiological accident (ECURIE), which is to some extent parallel to that of IAEA, has been established within the European Union in accordance with a Council Decision of Dec. 1987. For the Member States of EU, these two systems lead to duplication regarding exercises and communication tests. Furthermore, to some extent the two communication systems use different means of communication, thus increasing workload but hardly improving reliability. Communication tests are performed on more or less routine bases in accordance with the IAEA convention and between the Member States of EU through various ECURIE exercises. In this area we believe that there is a need for an extended

international co-operation with common exercises arranged by IAEA and the Commission of the EU. The purpose would be to avoid the use of procedures and formats which are not harmonised. Otherwise, such unaligned procedures can in practice obstruct or prevent the involved Member States from fulfilling their obligations in case of an accident.

2 INTERNATIONAL NUCLEAR EMERGENCY EXERCISES

The accidents at TMI and Chernobyl prompted various international organisations to start or intensify their activities within the field of emergency planning and preparedness during the late 1980s and early 1990s. The reason for that is mainly the different international and transborder aspects in the event of a severe nuclear reactor accident. One of these new activities launched by the Nuclear Energy Agency of OECD was the arrangement of international off-site emergency exercises as INEX 1 (1993) and thereafter followed by the ongoing planning of the INEX 2 regional exercises of which the first exercise will take place in Switzerland 7th November 1996. However, since several years bilateral exercises have been performed on more or less routine bases in different regions where nuclear reactor sites are located close to borders.

With the background of our participation in INEX 1 and our experience in the field of emergency planning we interpret that the overall purpose and the specific objectives of the INEX 1 set by the organiser were reached, even if the final analysis (evaluation report) of the exercises was delayed some years.

It was particularly valuable that the accident scenario considered the two different roles of countries in emergency response, depending on whether the country has a nuclear power reactor site or not. The exercise encompassed both an accident country and a neighbouring country, both of which affected by radioactive fallout. The exercise scenario also covered the post-release phases of an accident, which is an advantage as most exercises only deal with the initial phase of an accident.

Seen from our experience the scenario of INEX 1 was very well developed and useful. For the future we encourage such an international co-operation regarding the development of new exercise scenarios intended to be used in connection with national and bilateral exercises. The development of scenarios in the framework of an international expert group will stimulate participating organisations and emphasise the need to consider the various international aspects involved. It will also give an internationally accepted shaping and quality to the exercise scenarios. Not least for countries with only limited experience and resources in the field of peacetime radiological emergency planning such an international co-operation can be expected to be of great value.

However, we believe that most of the evaluation work of an exercise can and must be performed in the respective countries as many of the aspects considered are very country-specific. Large scale international co-operation in this respect seems therefore not to be of the same priority as the development of exercise scenarios.

3 MONITORING ARTIFICIAL RADIOACTIVITY

In case of an accident which is expected to cause or has caused fallout of radioactive substances the authorities in the involved countries need fast and reliable information on the location and characteristics of the fallout. Therefore most countries have established national strategies to map their territory in case of an inland as well as an accident abroad.

In addition to the IAEA convention on early notification and the ECURIE system, automatic gamma monitoring stations form the most common part of a national early warning system. Concerning the number of these monitoring stations expressed per unit area there are variations between the various countries from 1 station per 100 km² to 1 per 10 000 km². This means that countries as Germany has thousands of stations, Finland more than two hundred, Norway and

Sweden some tenths. To some extent these numbers also reflect a difference in the resources used for this purpose.

There are also extensive programmes in most countries for field measurements and laboratory analyses of environmental and food samples. Normally such a programme also includes high resolution measurements of airborne radioactivity using air filter stations and resources for airborne fallout mapping.

In accordance with the various international conventions and bilateral agreements an international exchange of measurement data is required in the event of a radiological emergency. To warrant a good quality and a comparability of the data exchanged there is a need for an extended international harmonisation regarding calibration procedures, instructions for the collection of environmental samples and the presentation of the values in connection with reporting of data. Which of all available data will be of most interest to communicate between the countries? To what extent shall data be excluded to avoid overloading of the communication systems or of the emergency response organisations in the various phases of an accident?

As we see it these are examples of questions which need an international discussion to reach some form of international standard or recommendation, in order to express the extent to which different measurement resources ought at least to be included in a national radiological emergency planning. The aim is to achieve a possibility to check whether a national emergency planning can be considered to fulfil an international agreed acceptance level concerning measurement resources. One further purpose with such a standard is to give a background for decisions to what extent a spending of resources can be considered as justified from the radiation protection point of view, including the need to have a background to give reliable information to the public in case of a radiological emergency.

4 CO-ORDINATION OF ASSISTANCE ACTIONS

In recent years a lot of assistance actions have been taken to improve the radiological emergency preparedness for peacetime accidents in Eastern Europe and the newly independent states of the former Soviet Union.

Stationary automatic gamma monitoring stations have been set up. National emergency plans have been reviewed by national teams. Various measurement and communication equipment, including computers, have been introduced to upgrade national laboratories, authorities and organisations involved in the various national emergency response organisations. Workshops on the establishing of a strategy for the information of the public, scientific visits and training courses have been organised.

Our experience is that in this field there is an urgent need to try to co-ordinate all different initiatives for assistance actions which now are going on or planned by international organisations and individual countries. Most of the assistance actions so far seem to have been performed without any co-ordination or attempt to prioritise contributions.

Recently an assessment study regarding the priority of needs for assistance in the field of radiological emergency planning has been done by the Commission of the European Union. Hopefully this study will be followed by an initiative to also co-ordinate future assistance actions to reach an effective use of available resources expended. Our belief is that a better co-ordination in the future of the various assistance actions will be of great benefit to the deliverer of assistance and not least for the receiving country.

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