

# TOPICAL ISSUE 1: RISK INFORMED DECISION MAKING

## Session Chairpersons' Summary

### Current Status

There is general agreement that 'risk informed decision making' has the potential to contribute towards maintaining and improving nuclear safety. It can complement the deterministic approach to nuclear safety and maintain the concepts of defence in depth and adequate safety margins. The discussions clarified the fact that risk informed decision making is a broader concept than just the use of probabilistic safety assessment (PSA). Risk informed decision making uses the results of PSA as one input to the decision making process, but allows for consideration of other factors, in particular aspects of safety management and safety culture. At present these aspects are included in PSA only to the extent that they are reflected in the plant specific data used, but they are not explicitly modelled in PSAs. Risk informed decision making is a process which can be used by the utility and the regulator, and provides the framework for risk informed regulation. The objective is to enhance regulatory effectiveness, using risk information to optimize nuclear safety regulations by eliminating regulatory requirements that are shown to be unnecessary in the light of this information, and thus to reduce regulatory burdens.

Whether risk informed regulation is of benefit to utilities depends to a large extent on the common understanding developed with the regulatory authorities. Since the preparation of a PSA imposes a considerable burden, in terms of the human and financial resources that need to be expended, it is of the utmost importance to define clearly what is expected from the utility and how the results will be used. This common understanding can be developed in a dialogue including all stakeholders. Risk informed decision making will strengthen the perception that the operator is assuming the primary responsibility for safe operation.

Risk informed decision making in areas that affect licensee requirements necessitates review (and, ultimately, approval) of PSAs and supporting information by the regulatory body. A suitable regulatory framework and regulatory staff with considerable technical capabilities in the areas of PSA and risk informed decision making are prerequisites for such review and approval. This constitutes a considerable burden for countries with small nuclear programmes and limited numbers of regulatory staff.

There is de facto international agreement on the probabilistic safety criteria proposed by INSAG, both for existing and future nuclear power plants. These criteria take the form of targets for frequencies of core damage and large releases of radioactive materials. These targets are also referred to in the new IAEA Safety Guide on "Safety Assessment and Verification for Nuclear Power Plants". These targets have been established without specifying the scope or methodology for the PSA to be performed to demonstrate compliance with them. For risk informed decision making it is necessary to use as reference points more detailed, lower level criteria for specific purposes. Such criteria are in use in some countries.

It is necessary to ensure the availability of high quality PSAs to support risk informed decision making. The meaning of “high quality” in this context can be variable and is defined as being commensurate with the intended use. Several Member States have developed national PSA guidelines, and the IAEA has prepared PSA guidance at the international level. An ASME standard on PSA is in preparation. Additional efforts to promote the production of high quality PSAs include peer reviews, establishment of user groups for similar type of plants, pooling of data, and preparation of reference PSAs.

Risk informed decision making can be successful only if all stakeholders understand the process and the results obtained. The general public is an important stakeholder and it is necessary to find ways of communicating the results of risk informed decision making to them.

In addition to the main nuclear regulatory body, a licensee has to deal with several other regulatory organizations, e.g. those responsible for environmental protection. If the concept of risk informed decision making is not shared by these other authorities, this might complicate the decision process. Thus, consistency between the approaches followed by different authorities will be beneficial.

## **Findings and Conclusions**

Depending on national situations and capabilities, some Member States are already well advanced in using risk informed decision making, whereas other countries are analysing the potential for and implications of its use. Therefore it is important that information on both positive and negative experiences is made available, widely disseminated and analysed. The IAEA should contribute by compiling and analysing such experience with a view to developing guidance on the use of risk informed decision making to enhance regulatory effectiveness.

In order to develop a common understanding between the regulator and the utility it is important to establish a dialogue in developing risk informed regulations. This should clearly identify what is required from the utility and how it will be used in risk informed decision making. Examples were provided where such a dialogue has included other stakeholders representing public interests.

At present not all regulatory bodies are technically in a position to make use of risk informed decision making. The IAEA should give emphasis to including in its programmes training aimed at strengthening the relevant capabilities of regulatory bodies.

Risk informed decision making requires criteria to be used as a reference. There is international agreement on the probabilistic targets proposed by INSAG and referred to in the IAEA’s safety standards. Work on compiling and analysing experience gained will necessarily include information on the criteria used.

It is necessary to ensure high quality PSAs to support risk informed decision making. To this end the IAEA should give emphasis to developing guidance, supporting user groups, facilitating the collection and pooling of data, and making available high quality reference

PSAs. In addition, the IAEA should consider preparing a “PSA quality guide”, based on an analysis of national developments.

It is necessary to communicate the concept, methods and results of risk informed decision making to all stakeholders, including the general public. One important aspect is to communicate the change in regulatory decision making within the regulatory organization itself. The IAEA should consider compiling experience in the communication of such information, with a view to developing guidance on effective communication.

Effective use of risk informed decision making requires a consistent approach by the various authorities involved in regulatory decisions. The process of developing risk informed regulation should take account of these interfaces and involve those authorities in the process to establish consensus. The IAEA could compile examples of such interfaces and ways in which approaches have been made consistent.