

SCIENTIFIC SUPPORT OF REGULATORY DECISIONS MAKING ON THE BASE OF RISK ASSESSMENT

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The scope of the nuclear energy use differs from other branches of industry by the gigantic concentration of energy in the elements of the nuclear objects. Therefore already during the designing of NPP the extraordinary technical and organizational measures are taken to prevent the emergency situations.

Among these measures we should mention well-founded conservatism of the designs, triple reservation of the safety systems, 5 barriers of the defence in depth, the state system of nuclear and radiation safety regulation, etc. According to the current legislation of the Russian Federation, the regulatory authority has the following powers in the scope of nuclear energy use:

- to develop, to approve and to give effect to the norms and rules;
- to license the activity for safety assurance;
- to inspect of norms and rules keeping;
- to inspect the conditions in which the licenses are acted giving the right to carry out the corresponding works,
- to inspect the safety assurance of the objects of the nuclear energy use;
- to inspect the systems of the registration and control of the physical defence of these objects.

Every regulatory power is provided with the necessary scientific support. In the field of the normative regulation the demands, criteria and principles of the nuclear and radiation safety (NRS) must comply with the demands of the Federal Legislation, International Conventions approved by Russia, as well as they must be scientifically based by the domestic experience of the exploitation of the nuclear energy use objects, by the achievements of the domestic and foreign science and engineering and by the recommendations of the international organizations. In the licensing process the decisions, made by the regulatory authority, must be based on the thorough and all-round expert review of the documents basing NRS. An expert review - this is a scientific assessment of safety, based on the demands of the legislation, normative documents and achieved level of the science and engineering, and is executed according to the scientifically based, distinctly fixed and documented procedures.

The execution of the inspecting functions also demands some scientific support in the form of analyses of the operation violations, developed databases etc.

In the domestic norms for the NPP the conception "nuclear and radiation safety (NRS)" is determined as follows: "The ability of the NPP during normal operation and at the operation violations, including the accidents, to confine the radiation effect on the personnel, population and environment within the fixed limits."

It is supposed the existence of the quantitative safety measure and numerical criteria of its determination. Whereas for the precise determination of the regulatory decision it is expedient to use only the terms "NRS assurance" and "NRS basing".

The safety is based on the deterministic and probabilistic calculation methods, on the experimental researches, which verify the calculation programs, on the statistic and expert analyses of the operation violations and on the other same scientific developments. At the same time the concept of NRS, essentially, consists of two connected but according their physical meaning different notions: radiation safety (RS) and nuclear safety (NS). This specific difference consists of empirically not testable duration of the potential radiation effect. As to the specific character of the nuclear safety, that is the global potential effect of the nuclear accident consequences on the man and environment.

The priorities of the nuclear safety assurance are stressed: the prevention of the failures of the normal operation and the prevention of the design bases accidents by the systems of the normal operation. Therefore on the base of preliminary scientific studies GOSATOMNADZOR of Russia approved and declared a number of important decisions:

- adherence to the application of PSA in the regulatory activity together with other safety assessment and safety analysis methods.
- the demands of the necessary execution of PSA-1 are included in the current regulatory documents;
- the results of the PSA and methods of its execution are the subject of a systematic discussion with the operating organizations.