



L. A. Bolshov

Academician of the Russian Academy of Sciences,
Professor, Doctor of Physics,
Scientific Leader of IBRAE RAN

Development of nuclear power industry, other types of nuclear power use is impossible without an effective and environmentally justified solution to the problem of radioactive waste (RW) disposal. It was only ten years ago when the society was expressing a strong concern for the continued accumulation of RW and its threat for the environment and human health, while there was no noticeable progress in the management of radioactive waste. Implementation of the Federal Targeted Program on Nuclear and Radiation Safety in 2008–2015, and adoption of the federal law on radioactive waste management have changed the situation. The process of establishing the Unified State System of RW Management (USS RW) is now steaming forward. A considerable role in the process is played by the disposal fees, and, consequently, the desire of operators to part with RW in the most efficient and cost-effective way.

The situation calls for scientific justification of the whole range of decisions being made, ranging from regulatory to technical. A scientific and technical forum for qualified discussion of all issues associated with development of the unified state radioactive waste management system is a required condition for unbiased scientific consideration. Unfortunately, up to now, there was no such periodical among the journals dedicated to development of nuclear science and technology in Russia, while there is a considerable range of journals on the subject abroad. A detailed analysis of publications on RW issues in our country and abroad is given in one of the articles of the first issue of the new journal. I believe that the need for a dedicated scientific and technical journal on the issues of RW management does not require further justification, and we may proceed to detailed analysis of the goals of the journal.

Our vision of the journal for the upcoming two years: a peer reviewed scientific and technical journal in Russian and English. The plans for the future years: the journal to be included in the list of Higher Certification Committee and the respected scientific bibliographic databases with high scientometrics parameters. Our confidence is based on the high value of the subject, which most of the articles will be dedicated to.

The top of the subject list is justification and safety case for RW disposal. This is an extremely complex task, especially, for high and intermediate activity long-lived radionuclides. First, the level of international requirements to such facilities is currently very high and is cemented by the requirements of the “Joint convention on the safety of management of SNF and the safety of management of RW”.

Second, the safety case shall lead to the issue of justified acceptance criteria, which should allow the major part of the accumulated and generated RW to be routed for disposal. At the same time, one of the most practically viable tasks is justification of efficient approaches to disposal of low-level waste. I would let myself to state a truism that there is nothing as simple, also from the viewpoint of funding processing and safety case, as to place the low-level radioactive waste into the most durable containers, place the latter in a massive reinforced concrete containment located in ideal hydrogeological conditions. It is evident that such an approach leads to unacceptable waste of resources, contradicts to common sense and does not correspond to the principles of radiation protection and international approaches.

The papers on safety case studies have been already included in the first issue of the journal, and the number of such papers shall not reduce until the moment of commissioning of the disposal facilities. At the same time, it shall be noted that the problem of safety case development in the long term is a multi-disciplinary problem and papers on the subject should also be present in other segments of scientific periodicals. In this connection we also envisage the task of regular monitoring of periodicals and publication of relevant summaries.

The second topical section, which will be considered in the journal, is safety of the existing RW storage facilities. I believe that the viability of safety case studies for allocation and conservation of special types of RW is already evident. The same applies to the issues of operation of RW storage facilities in the cases when safety of operation is evident for specialists. Today, it can be stated that there are virtually no specialized papers characterizing radiation safety parameters, as well as operational parameters of disposal and storage facilities based on practical experience.

The third planned topical section is RW characterization at all process stages, starting from generation and ending with conditioning. Such characterization shall optimally be done not by linear increase of instrumentation capabilities, but in a finer way and shall be guided by final disposal rather than the current activity of radionuclides.

The issues of feasibility of RW management procedures will also be among the problems considered by the journal. From our point of view, the economical optimization of decisions may be a key factor in development of the state policy of RW management under the conditions of limited economic and financial resources available in the country. This section shall include theoretical and methodological approaches to economic analysis of the problem, proposals and recommendations on forming the financial, economic, organization and management models of RW management, methods of cost assessment to implement the measures with account for indeterminacy factors, practical examples of economically justified decisions being taken, and other economic aspects.

The subject of the highest practical importance, the operation of RW reprocessing facilities, will also be a standing section of the journal. Moreover, we plan to include advertisements of such installations, although with a condition that they are supported by papers confirming the stated parameters of the installations.

The same approach is planned to be used with respect to other equipment planned to support USS RW functioning. This includes various instrumentation, containers and other packages, transportation systems, etc. In our opinion, it is not the improvement of parameters of specific products that is of importance, but the production of the whole range of products for different types of RW, and, of course, standardization of products.

The issues of RW management regulation are currently resolved only in the first approximation. The basic norms have been born in relatively fast-paced theoretical discussions accompanied by a number of concerns. I will give one example, where I have observed the final stage of the process with my own eyes, – the criteria of waste categorization as RW, as special RW, and general categorization criteria. Relatively successful solution was found only for LRW. The extremely short-lived radionuclides still play a role in categorization of waste as RW, though in this case determination of their contribution not only from the point of view of disposal, but also for accounting purposes is pointless due to very limited period of their existence. With respect to the so-called gaseous waste, there remains an obscure from a practical point of view wording, which is never applied in reality. Similar problems exist for naturally occurring radioactive materials. Incompleteness of regulation for special RW is also fairly evident. There is a growing awareness of the need to correct the RW categorization process, which shall be directed by disposal needs, etc. The listed circumstances present the motives which shall become an object of a detailed and comprehensive review aimed at further updating of the regulatory basis. This work is already underway and will gradually bear its fruit.

Certain attention in the journal will also be given to international events in the field of RW management, including international and Russian conferences and workshops.

To conclude, I would like to express hope and confidence that the journal will be helpful to a wide audience of specialists. It is planned that in addition to the printed version, the journal will be available on-line at www.RadWaste-Journal.ru. The time lag between the printed and the online versions has not been yet decided on. We hope that it will be minimal given the due activity of the subscribers or establishment of other sources supporting the production of the journal.

L. A. Bolshov