

ON A WORKFLOW FOR THE REGULATORY BASIS DEVELOPMENT IN THE REALM OF RW MANAGEMENT

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The paper focuses on the development of proposals regarding certain amendments to be introduced to some provisions of the Federal Law "On Radioactive Waste Management" and key criteria such as waste designation as radioactive waste, waste designation as non-retrievable and retrievable waste.

Keywords: *radioactive waste (RW), regulatory control over RW management, the federal law on radioactive waste management, criteria for attribution to RW, criteria for attribution to non-retrievable and retrievable waste, RW classification for retrievable waste.*

In 2018, a new version of the State Policy Fundamentals in Nuclear and Radiation Safety of the Russian Federation for the period up to 2025 and further perspective was approved with radioactive waste management challenges still being considered as the priority ones. In February 2019, in keeping with the adopted procedure, the Government approved an Action plan enabling the implementation of the Fundamentals. The first two areas stated under the Action plan were directly related to the development of a regulatory framework in the field of radioactive waste management specifying the intended timeframes for relevant goals to be achieved by the State Corporation "Rosatom" and Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostekhnadzor).

The first measure stated in the Plan was aimed at enhancing the regulatory framework in the field of radioactive waste management, including relevant criteria, principles, regulatory system and basic requirements associated with nuclear and radiation safety. These were specified taking into account standards and recommendations of international organizations in the field of atomic energy use with

the implementation timeline reaching 2020–2021. Responsible executive authorities: State Corporation Rosatom and interested federal executive bodies.

The second measure deals with a more specific problem, namely, the development and submission to the Government of the Russian Federation of a draft Government resolution on amending certain provisions of already existing Government Resolution of October 19, 2012 No. 1069 "On Criteria Used to Categorize Solid, Liquid and Gaseous Waste as Radioactive Waste, Criteria Used to Categorize Radioactive Waste as Non-retrievable Radioactive Waste and Retrievable Radioactive Waste and Criteria for Retrievable Radioactive Waste Classification" (hereinafter Government Resolution № 1069). Execution period — 2020. Responsible authorities: Rostekhnadzor, State Corporation Rosatom, interested federal executive authorities.

To implement the approved Action Plan, the State Atomic Energy Corporation Rosatom had formed a working group that developed a sectoral schedule for the implementation of the Action Plan by the State Atomic Energy Corporation Rosatom and its

organizations (approved by the order of the State Atomic Energy Corporation Rosatom of April 16, 2019 No. 1-1/300-r).

Under the first focus area discussed above, the developed timeline provides for the submission to the Legislative Support Department of a draft law allowing for some amendments to the Federal Law No. 190-FZ On Radioactive Waste Management [2] (hereinafter Law No. 190-FZ). It also involves the development of some supporting materials in accordance with the formal workflow on arranging legislative drafting activities set for the State Corporation Rosatom. Deadline — January 2020. Responsible authorities: Directorate for State Policy in the Field of RW and SNF Management and Nuclear Decommissioning. This means that all substantive issues associated with the required amendments should be fully worked out until this date. Development of a road map (action plan) enabling to arrange further approval of the draft law and the supporting materials by interested federal executive authorities and its submittal under the established procedure to the Government of the Russian Federation is viewed as a next stage of this process. Legislative Support Department of the State Corporation Rosatom was assigned as the body being responsible for this stage.

The sectorial time-schedule provided under the second focus area mentioned above sets a timeline for the submittal of consolidated proposals of the State Atomic Energy Corporation Rosatom on amending certain provisions of the Government Resolution No. 1069 of November 15, 2019 to Ros-technadzor. Responsible parties: Directorate for State Policy in the Field of RW and SNF Management and Nuclear Decommissioning and Department of Corporate Work.

Thus, discussions and debates on the amendments to be introduced to the Law No. 190-FZ and Government Resolution No. 1069 are reaching their final point which has been also discussed in some literature sources, including [3–8]. Below are briefly summarized the previous milestones.

Discussions on regulatory framework enhancement

Efforts aimed at evaluating the effectiveness and soundness of statutory instruments were practically implemented on a constant basis and covered several areas, including provisions of Law No. 190-FZ, government resolutions and federal norms and rules. However, to introduce certain important amendments to the basic regulatory acts some thorough demonstration supporting their need was required. For these reasons, in 2015, amended was

only the Government Resolution No. 1069 — these amendments enabled to eliminate some obvious mistakes (²³⁸U listed in the criteria set for categorizing waste as radioactive and clarified provisions on the categorization of radionuclides as long-lived ones under retrievable radioactive waste classification), although the initially proposed amendments involved a wider list of proposals, including the establishment of classification criteria for retrievable RW based on the maximum allowable specific activity (MASA).

In 2016, after five years of law enforcement practice, on the initiative of the State Atomic Energy Corporation Rosatom, remarks and suggestions of operating organizations regarding the identified flaws of the existing regulation started being compiled under the USS RW. Over 15 enterprises (including key RW generators, such as JSC “Concern Rosenergoatom”, JSC “TVEL”, FSUE “PA Mayak”) submitted some 80 remarks and suggestions. Four groups of remarks and suggestions could be identified in the summary list compiled, namely:

1 Remarks and suggestions being relatively clearly understood which should be adopted to increase regulatory efficiency and the loyalty of current legislation with respect to operating organizations;

2 Remarks and suggestions concerning actual problems, but focused on an ambiguously chosen method proposed for their solution;

3 Remarks and suggestions addressing a number of challenges requiring in-depth study and/or introducing some interconnected amendments to several regulations;

4 Remarks and suggestions introducing no actual changes to the practice of radioactive waste management, however, producing a positive impact on the establishment of the Unified State System for Radioactive Waste Management (USS RW) or having no particular prospects for their harmonization.

Further efforts were focused on the first two groups presented in the above list. By the first half of 2018, issues associated with the adjustment of various regulatory aspects differed significantly according to the degree of their elaboration (Table 1).

In 2018, given the interdepartmental nature of RW management activities, upon the initiative of the Director for the State Policy in the Field of RW and SNF Management and Nuclear Decommissioning of the State Corporation Rosatom, a coordinating interdepartmental commission for USS RW development (hereinafter — CIC) was set up as a consultative body whose activities were focused on the interdepartmental coordination of relevant efforts implemented by federal executive bodies (hereinafter FEB), government authorities in the field of atomic energy use, government authority in the

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Table 1. The development maturity of certain amendments to be introduced to priority regulations by early 2018

Regulatory aspects	Impact on practical implementation of activities	Maturity degree
Federal Law N 190-FZ		
Management of non-retrievable RW	High	High
Management of very-low level RW	High	High
Management of RW from decommissioning	High	High
Management of short-lived RW	High	High
Financial model for RW disposal	High	Average
Government Resolution N 1069		
Categorization of waste as RW	Low for the majority of sectorial enterprises	Average
Categorization of RW as retrievable or non-retrievable RW	High	High
Classification of retrievable RW for disposal purposes	High	Average

field of radioactive waste management (hereinafter referred to as the state administration bodies), as well as the authorities responsible for the state regulation of safety in the field of atomic energy use. CIC members were approved by Order of the State Atomic Energy Corporation Rosatom. The first CIC meeting held in June 2018 was devoted to the challenges in the legal regulation of radioactive waste management activities. Based on CIC findings, a decision was made to set the Law No. 190-FZ and Government Resolution No. 1069 as priority regulatory acts requiring certain updating.

It should be noted that as regards the Federal Law No. 190-FZ only a few points were not worked out by that moment, namely those associated with the financial model covering the activities on waste disposal undertaken under the USS RW, development of an optimal workflow enabling coordination of the issues associated with the management of funds under the special RW disposal fund and general planning of waste disposal activities. Discussion of these issues is still underway.

Three systems of criteria refer to relevant provisions of the Government Resolution No. 1069: waste categorization as radioactive waste; RW categorization as retrievable RW and non-retrievable RW; classification of retrievable RW for disposal purposes.

As it comes to criteria used to categorize waste as radioactive, questions were raised only regarding certain aspects (categorization of gaseous RW based on the exceedance of allowable specific

activity limit for the population, certain criteria for RW classification set for small RW amounts, criteria used to categorize waste of unknown radionuclide composition as RW), which could not produce any significant impact on the waste management practice.

At the same time, referring to the criteria used to categorize RW as retrievable or non-retrievable, some additional requirements (regarding the wording used in the provisions of Law No. 190-FZ) on RW origin and location set up in relevant provision of the Government Resolution No. 1069, have prompted a number of deferred decisions on specifying the legal status of some existing RW disposal facilities [9]. This created certain difficulties, including organizational ones, during the implementation of efforts aimed at enhancing the safety of storage facilities (SF) for accumulated RW (the need to revise the boundaries of settlements, etc.). This challenge can be addressed by eliminating the unreasonable requirement regarding the RW origin and harmonizing the schedules for RW SF commissioning and Law No. 190-FZ enactment. Such a decision would result in a significant decrease of radiation risks for personnel and the population also providing a many-fold reduction in the cost associated with the implementation of measures aimed at increasing the safety level of some facilities [9, 10]. However, it requires extensive justification, since public concerns can give rise to relevant discussions. Moreover, some issues were identified during the discussions on the rational use of such storage facilities' available capacities allowing to accommodate the radioactive waste generated from the decommissioning of other nuclear facilities, as well as waste from the operation of other facilities with identical characteristics, for example, rare-earth metal mining.

The case of criteria set for retrievable RW classification for disposal purposes was more complicated. The main problems were identified [3, 4, 7, 10] in the following areas: some types of RW could be attributed to potentially more hazardous classes, for example, reactor graphite, highly active metal RW from nuclear power plants with induced activity, etc.; absence of a specific class set for very low-level waste; unreasonably strict standards applied if waste contains radionuclides characterized by the lowest radiation hazard, which, based on the established minimum significant specific activities and the current classification system, can be directly assigned to RW class 3 or 2 if relevant activity set for these classes is reached, and some others. Comprehensive solution of the existing flaws required a number of special research and analytical activities to be performed in 2016–2018, aimed, in particular,

at obtaining a detailed picture of the financial and economic background demonstrating the need for these changes. The results obtained enabled to form a scientific and technical basis, which currently forms the basis of efforts on the Government Resolution No. 1069 updating.

Amending the Government Resolution No. 1069

Suggestions on the key methodological approaches to be applied during the development of proposals on amending the Government Resolution No. 1069 were considered and tentatively approved at a meeting held in June 2019. At the meeting, a decision was made on setting up a working group assigned with a task of developing numerical classification criteria taking into account the approaches considered. The working group involved experts from the State Corporation Rosatom (Dorofeev A. N.), IBRAE RAS (Samoilov A. A., Utkin S. S), STC NRS (Kuryndin A. V., Ponizov A. V.), VNIIAES (Ivanov E. A., Sharov D. A.), FSUE "NO RAO" (Konovalov V. Yu).

Within the working group, the principles for adjusting the classification of retrievable RW were generally agreed upon:

1 Setting a plan for the development of DFRW system and establishment of financial capabilities supporting RW disposal activities – these points were identified as tasks in the field of retrievable RW classification. These imposed some boundary conditions on its development: evaluation of criteria based on framework safety assessments and the need for an unambiguous identification of RW class at waste management stages by the operating organization.

2 Classification should not replace the acceptance criteria that are to be developed for each individual RWDF during the iterative procedure allowing to agree upon the characteristics of the disposed RW and relevant safety requirements, taking into account some particular features of the disposal site, as well as the design of the engineered safety barriers (EBS).

3 Based on the classification system, already completed activities on waste emplacement, design, construction and operation of RWDF should be kept within legal boundaries also taking into account the presence of stable radioactive waste streams with some typical properties.

4 In the future, the RW classification system, apparently, should be considered under the framework of federal norms and rules in the field of atomic energy use (requiring some adjustment of 190-FZ provisions). This will allow harmonizing criteria and requirements on the demonstration of RWDF

safety, which will be done within a unified regulatory system, also enabling their timely adjustment taking into account the practice of RWDF design development and RW transfer for disposal.

In the short run, the working group should complete the following tasks:

- take a final agreed decision on the shortlist of classes set for retrievable RW and the principles allowing to identify relevant numerical values for the classification criteria;
- develop a draft amendment to the Government Resolution No. 1069;
- compile a plan on the development (adjustment) of federal norms and rules coupled with the new classification criteria.

The draft amendments to the Government Resolution No. 1069 developed by the working group will be further discussed with the involvement of an extended expert community, including the representatives of operating organizations.

Amendments introduced to the Federal Law No. 190-FZ

As noted above, issues associated with the financial model covering RW disposal activities are considered as a most problematic task in amending the Federal Law No. 190-FZ. These are currently being discussed, and the final wordings introduced as part of the amendments will be determined, in particular, based on the decisions adopted to address these issues. A brief description of individual proposals on updating the Federal Law No. 190-FZ, which are currently being considered as priority options addressing the existing problems, is given below under "Problem – Solution" format.

Problem: Primary RW registration was limited in time, there were no legal mechanisms allowing to perform the primary RW registration procedure in case of newly identified RW, in particular in case of ownerless (abandoned) RW, and it was not possible to introduce any changes to the results of the primary RW registration if some new circumstances were identified, namely those associated with waste amounts and characteristics documented based on the results of primary RW registration campaign.

Decision: It seems feasible to provide for the development of a Government Resolution setting out the procedure for introducing necessary changes into the results of the primary RW registration and RW site identification by amending part 4 of Article 23: "4. The Government of the Russian Federation shall specify the procedure and the timeframes for the primary registration of RW generated prior to the enactment of the Federal Law, identify RW sites and approve a reference form for the

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primary RW registration act, approve the procedure for amending the results of the primary RW registration and RW sites identification campaign”.

Problem: Lack of investment opportunities for the special reserve fund, resulting in the depreciation of the accumulated funds and in the need for setting higher disposal tariffs.

Solution: To provide opportunities enabling to manage the funds by introducing an amendment to Article 5 of Law No. 190-FZ. This amendment will allow the Government of the Russian Federation to establish the procedure for investing temporarily available funds of the special reserve. Article 18 is to be amended as well providing for a supplement allowing the authority responsible for the management of RW to manage the assets of the special reserve fund under a procedure established by the Government of the Russian Federation. At the same time, the management itself should consist not only and not that much in the acquisition of highly reliable securities (government bonds, etc.), but in the use of funds received for the disposal of relevant RW classes, subject to final isolation in appropriate RWDF planned for construction in the longer term; for the construction of RWDF planned for construction in the short term (of course, with subsequent switching of funds in the future in the opposite direction).

Problem: a single payment procedure has been established for all RW generated by nuclear operators (according to the generation forecasts) not accounting for the particular features of waste generation. This may cause practical difficulties for such organizations in case if these are engaged in decommissioning or cleanup (remediation) efforts as contractors. For example, inclusion of large RW generation amounts into relevant forecasts can result in financial destabilization due to the need of making forecast payments, while the contractor is paid only upon the provision of relevant services.

Solution: For specific RW types, the possibility of “payment upon delivery” is introduced with relevant amendments being introduced to Article 2.

Problem: No incentive to create RWDF for VLLW, since no regulation exists to manage the ownership rights over such disposal sites, including a particular procedure allowing the transfer of such RWDF to NO RAO. Moreover, there is no separate payment procedure for the disposal of RW subject to final isolation in such disposal facilities.

Solution: To regulate the legal regime of ownership for VLLW disposal facilities constructed by organizations on their sites, Article 9 provides for the legal entity’s ownership for VLLW disposal facilities and RW generated as a result of mining operations. Article 40 also specifies particular procedure

allowing the transfer of such RWDF. The regulatory framework provides for a mandatory transfer of RWDF ownership rights to the State Atomic Energy Corporation “Rosatom” after the RW emplacement operations are completed, depending on the period of potential hazard presented by the RW. It also seems appropriate to precise on the fees paid by organizations to the special reserve fund.

Problem: Lack of a transparent and understandable procedure allowing to pay for the disposal of waste being subject to isolation in disposal facilities for non-retrievable RW.

Solution: This problem is supposed to be addressed by means of deductions to reserve funds formed by nuclear operators being established with the purpose of ensuring the safety of such facilities at all stages of their life cycle and development.

Problem: For all facilities holding non-retrievable RW a procedure was established describing their evolution and relevant status changes: RW site — conservation facility — disposal facility. However, based on the developed strategic decisions, individual facilities (for example, industrial reservoirs V-10 and V-11) are subject to long-term controlled operation until the decision is made on their withdrawn from regulatory control based on the radiation factor.

Solution: Part 3 of Article 24 should be clarified as follows: “Facilities holding non-retrievable radioactive waste should be upgraded to conservation facilities or disposal facilities for non-retrievable waste with the exception of relevant facilities containing short-lived radioactive waste, the specific activity of which due to the decay of radionuclides during storage can be reduced to a level at which such waste ceases to be considered as radioactive”.

Problem: No unambiguous interpretation of the legislative norms regulating the issues associated with the isolation of newly generated RW in facilities holding non-retrievable RW. In some cases, it appears technologically feasible to continue the emplacement of RW into the facilities for non-retrievable RW given the optimization principle. In this case, it is necessary to impose relevant restrictions on such activities.

Solution: Article 26 is supplemented by a norm authorizing under certain conditions the emplacement of radioactive waste into facilities holding non-retrievable RW. These conditions are similar to those specified in Article 30 regarding the possibility of disposing liquid radioactive waste in deep disposal facilities. Details regarding the payment procedure for the disposal of RW in facilities for non-retrievable RW has been also specified.

Problem: No specific management procedure is set for spent sealed sources of ionizing radiation

which can potentially result in excessive disposal costs. Provisions are to be set enabling to separate them into a separate stream with appropriate tariffs and disposal rules being specified as well.

Solution: Article 29 elaborates on the possibility of transferring sealed spend radiation sources to a specialized organization for processing, and also provides for the possibility of their disposal in a purpose designed facility.

Conclusion

By the time this article is published, the situation on updating retrievable RW classification criteria set for the purposes of its disposal will be substantially clarified. However, this work cannot be considered completed: a series of serious discussions are to be held, including those that are to take place after the publication of the draft Government Resolution of the Russian Federation. This will provide an opportunity for the interested parties to once again present their opinions on its content, including relevant supporting remarks. At the same time, it seems quite helpful to accumulate all the suggestions in the editorial office of the Radioactive Waste Journal allowing for their further detailed public presentation, namely explaining why some of the comments and suggestions were accepted or rejected, since the content of the criteria is extremely important for the development of the USS RW.

The situation is quite similar as regards to the amendment of the Federal Law 190-FZ but the margin of time is much longer. In this regard, it seems important that this and next year's publications of the Radioactive Waste Journal present comments on individual adjustments involving the positions of interested industry organizations and other departments. As regards these materials of particular value are the economic assessments of the proposed changes and the evidence-based demonstration of their safety. Such materials would be of use in inter-departmental coordination and discussion of the draft law by the State Duma and the Federation Council.

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