

Creation of the Radioactive Waste Management System in the Russian Federation – 11266

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ABSTRACT

This paper gives an overview of creation of the RW Management System in the Russian Federation. This process includes three areas: legal requirements, participants and facilities. One of the important steps was the adoption by the Russian Government of the Federal Target Program "Nuclear and Radiation Safety for 2008 and for the period till 2015". The aim of this Federal Target Program was the elimination of consequences of the nuclear legacy.

The same year (2008) was the start for drafting the federal RW Management Act. [1] The main Act's ideas are: 1) establishing of the high level legal regulations (key principles of the RW management system); and 2) preventing further uncontrolled accumulation of RW. Now it should be enacted by the State Duma.

In order to provide its own interests in sustainable development, Rosatom is implementing its RW management strategy. This Strategy was approved by Rosatom direct general in 2010. In connection with this Strategy the subsidiary companies of Rosatom is developing its own local RW strategies. These local RW strategies should become a key element for quick adaptation of these companies to the RW Management System of the Russian Federation.

INTRODUCTION

Safe and effective management of RW and SNF is the main and necessary condition for the development of the nuclear industry. For the countries, involved earlier in the state defense nuclear projects, including Russia, this task becomes complicated due to the need to solve simultaneously the problem of previously accumulated RW and SNF - the problem of the nuclear legacy.

The principle of deferred decisions was applied to RW and SNF management in USSR and Russia. The generated waste was usually stored at enterprises, which formed these waste during their activities. As a result today more than thousand interim waste storage facilities are located at the territory of Russia. Part of these facilities appears to be a potential source of serious environmental risks. SNF was partially reprocessed, but the main part was placed for storage. [2]

THE FEDERAL TARGET PROGRAM “NUCLEAR AND RADIATION SAFETY FOR 2008 AND FOR THE PERIOD TILL 2015”

In 2005 it was decided at the national level to develop a program of works aimed at addressing nuclear legacy problems. Nuclear Safety Institute of the Russian Academy of Sciences was assigned to be an organization responsible for the program development. In 2007 the program was approved by the Government of the Russian Federation. In 2008 program implementation was initiated (the Federal Target Program “Nuclear and Radiation Safety for 2008 and for the period till 2015”). [3]

The Program includes creation of SNF management infrastructure facilities, including a large SNF storage facility at the Krasnoyarsk Territory. [4] The new dry storage facility is designed to store SNF from RBMK (high power channel type reactor) and WWER-1000 (water cooled, water moderated power reactor) reactors. Works on creation of a new pilot reprocessing facility have been started there. Working out issues related to closed nuclear fuel cycle is still regarded as an important national objective. A new program of developing a new technological atomic energy platform, launched in 2010, is also aimed at addressing the closed nuclear fuel cycle issues. [5] And only in some cases SNF can be recognized as RW. [6]

The program also includes a large scope of works on creation of RW management infrastructure facilities, including the underground laboratory for try - out of high level waste disposal in geological formations.

Program includes also the following activities:

- decommissioning and (or) elimination of shutdown nuclear and radiation hazardous facilities and disposal of retired radiation facilities and spent radiation sources;
- improving the safety of nuclear and radiation hazardous facilities of the nuclear weapons complex;
- improving the safety of accumulated SNF and RW management.

Implementation of the Federal Target Program of Nuclear and Radiation Safety will make it possible to prepare for decommissioning 188 nuclear and radiation hazardous facilities, to eliminate 42 nuclear and radiation hazardous facilities, to rehabilitate 1.42 million m² of radiation contaminated areas, to ensure the safe maintenance of shutdown nuclear and radiation hazardous facilities.

Implementation of the Federal Target Program of Nuclear and Radiation Safety is the first step to address nuclear legacy problems. Inventory of nuclear legacy, envisaged by the Program, will allow forming a sound basis for addressing these problems in the future.

THE PROJECT OF THE RW MANAGEMENT ACT

It is recognized at the national level that it is hopeless to further continue the existing practices, which require permanent increase of costs for the safe RW management, and there is a need to change radically the practices. This is reflected in the decision to create the RW Management System in the Russian Federation.

The federal RW Act should implement this decision at the legislative level. Development of the draft Act was initiated in 2008 with the active participation of the paper authors. At the end of 2009 the draft Act was approved by the Government of the Russian Federation. Currently the draft act is being reviewed in the State Duma. According to the draft Act the main waste management principles include: the necessity to dispose RW in a timely manner and full financial responsibility of waste producers over the whole management cycle, including disposal.

The draft Act provides for the establishment of the national RW management operator - organization responsible for the implementation of RW disposal and creation of necessary infrastructure. The Federal State Unitary Enterprise "RosRAO" is being considered now to be such organization - a company dealing with RW management, having an extensive network of branches (from Kamchatka to Murmansk) and having necessary personnel and technical capacities to perform the functions of the national operator.

The draft Act states that all further RW management activities will be carried out in the framework of the integrated state system. The purpose of creation and operation of the integrated state RW management system is to provide conditions, under which a) all generated RW will be timely disposed basing on the principle of full financial RW manufacturer's responsibility and b) previously accumulated RW will be placed at disposal facilities in the waste location or at a centralized disposal facilities with the state financial support on a planned basis.

It is planned that creation of the integrated state RW management system will be carried out gradually. For example, at the first stage it is expected to carry out a comprehensive revision of the regulatory acts system, regulating various RW management aspects. The preliminary review of some of these regulatory acts governing RW management issues is already started. Primarily federal rules and regulations governing the RW disposal are revised: the development of waste acceptance criteria for disposal and creation of RW classification system. The need for accelerated development of these documents is caused by the decision to form the reference system for RW producers, allowing them to transform their further activities to be in accordance with the draft Act requirements. It is expected that the first stage will be completed in 2013.

At the second stage a disposal system for very low level, low level and intermediate level RW will be created. The first major disposal facilities should be operational in 2015 and the whole system should be created by 2018-2020.

At the third stage of the RW Management System in the Russian Federation creation an operation of high level waste repository will be started. Tentatively it will happen in the period of 2025-2030.

The draft Act has attracted wide attention of the public, environmental groups, interested agencies, governmental bodies of the subjects of the Russian Federation. During the discussion and preparation for the second reading over three hundred amendments, addressing a variety of aspects of RW management, were obtained. A significant part of the proposed amendments is adopted and incorporated into the draft Act. In particular, the draft Act includes regulations tightening the requirements for RW management. For example, creation of new facilities for

injection of liquid RW in deep horizons is prohibited. Strict rules governing the import and export of RW from the country's territory are established.

Presently one can assume that the draft Act will be passed and come into force in 2011.

RW MANAGEMENT STRATEGY OF ROSATOM

Rosatom will manage the national RW management system. At present, the program of RW management strategy of Rosatom has been developed, approved and being implemented.

The program includes a large scope of works. Let's consider some of them, such as:

- accelerated adaptation of the industry organizations to the RW management strategy of Rosatom requirements;
- establishment of priority RW management infrastructure facilities.

An important activity of the RW management strategy of Rosatom creation is an initial registration of RW and its locations. Data obtained during initial registration should become an information basis for sound planning of follow-up activities related to accumulated waste management.

LOCAL RW MANAGEMENT STRATEGIES

One of the initial program activities is the development of local RW management strategies for the industry organizations. Local RW management strategies should become a key element for quick adaptation of industry organizations to the RW management strategy of Rosatom requirements and become a basis for corporate planning of RW management. They are aimed at achieving a state, when the problems of safe RW management at the enterprise are addressed comprehensively.

The objectives of the local organization's strategy include:

1. Statement of the conception of reorganization of RW management system in organization to bring it into conformity with the requirements and principles of the integrated state RW management system;
2. Preparation of input data to forecast RW generation volumes and RW interim storage limits (volumes and time schedule) at the organization's territory;
3. Preparation of input data to form an integrated corporate technological policy;
4. Planning the activities related to accumulated RW management.

Local RW management strategy shall maximally take into account the existing features in the organization's RW management scheme, set time, technological and economic parameters to transform it in order to comply with new requirements and enable corporate planning of RW management and scaling of promising technologies and solutions.

It should be noted that creation of disposal facilities has already begun. With respect to disposal facilities for low level and short-lived intermediate level waste pre-design works for the creation of such facilities have been launched in the Northwestern and Volga Federal districts. At the

Krasnoyarsk territory an underground laboratory for validation of safe high level and long-lived intermediate level waste disposal in deep geological formations is being created. In this regard it is important to note that the program includes measures to accelerate the development of methods of safety assessment of RW disposal facilities and emphasizes the need for international cooperation in this field.

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