

# **Regulatory requirements on management of radioactive material safe transport in China**

**Abstract:** Since 1980s, the IAEA Regulation for safe transport of radioactive material was introduced into China; the regulatory system of China began with international standards, and walked towards the institutionalized. In 2003 the National People's Congress (NPC) promulgated "the Act on the Prevention of Radioactive Pollution of the People's Republic of China". In 2009 "Regulation for the Safe Transport of Radioactive Material" (Referred to "Regulation") was promulgated by the State Council. Subsequently, the National Nuclear Safety Administration (NNSA) began to formulate executive detailed department rules, regulations guidelines and standards. The present system of acts, regulations and standards on management of safe transport of radioactive material in China and future planning were introduced in this paper.

Meanwhile, the paper described the specific administration requirements of the Regulation on classification management of radioactive materials, license management of transport packaging including design, manufacture and use, licensing management of transport activities and the provisions of illegal behaviors arising in safe transport of radioactive material.

**Key words:** transport; safety; the Regulation; management

## **1. Introduction**

Safe transport of the radioactive material, as an important aspect for radiation protection and nuclear safety, is an essential part for China to enhance the management and technical level of nuclear safety.

Since 1980s, the IAEA Regulation of safe transport of radioactive material was introduced into China, promulgated and adopted as GB11806-89; the regulatory system of China began with international standards, and walked towards the institutionalized. And in 2004, GB11806 has been revised.

However, due to lack of administrative regulations' support, it's difficult to establish a sound management system; the standard has not been fully implemented. Meanwhile due to the lack of government regulation for the transport packaging design, the packaging performance and manufacture quality exist great uncertainty. These brought extra risk for radioactive material transport. In contrast, because of the society fear of radioactive material transport activities, repeat management, bull environment for approval, and even refusing transport phenomenon are exist.

The implementation of two laws, Act on the Prevention of Radioactive Pollution and Administrative License Law, also put forward higher requirements to safe transport of radioactive material. Rregulatory system of radioactive material transport must be improved as soon as possible, in order to regulate the safety management and surveillance, to improve the safety and management level of transport of radioactive material.

Regulations for the Safe Transport of Radioactive Material (hereinafter referred to as the Regulation) , adopted at the 80th Executive Meeting of the State Council on June 7, 2009, are hereby promulgated and gone into effect on January 1, 2010.

## **2. Specific requirements of the Regulation**

### **2.1 Category based for radioactive material transport**

Because of wide variety of radioactive materials with different properties and different potential environmental risks, the management must be category based in order to achieve scientific and efficient regulation. Therefore, Regulation provides that radioactive material shall be classified into Category I, Category II and Category III, based on their properties and their potential hazards which may cause to human health and the environment. For the implementation of category management measures, the classification and catalogue of the radioactive material has been formulated by the regulatory Body for nuclear safety jointly with the organizations for public security, health, customs, transport, railways, and civil aviation as well as nuclear industry.

### **2.2 Licensing management of transport packaging**

Due to potential danger of radioactive material, and its transport safety mainly dependents on transport packaging performance with tolerance, shielding, cooling and prevent criticality, transport safety management must be from the source, the transport packaging safety management. The Regulation says that radioactive material has to be transported using dedicated packaging. The radioactive material transport, and the design and manufacture of packaging shall meet national standards for the safe transport of radioactive material.

The unit engaged in design and manufacture of packaging shall establish a sound responsibility system, strengthen quality management, and bear the whole responsibility for the activities related to the design and manufacture of packaging.

#### **2.2.1 Management provisions of packaging design**

To strengthen the management of packaging design, the Regulation made the following major provisions:

The first is to establish the safety analysis system. The unit engaged in design of packaging shall make the safety assessment, and accurately record the design and safety assessment process.

The second is to establish the approval system for Category I packaging. The packaging design should be reviewed and approved by the regulatory body of nuclear safety before the first manufacture, and defined the application materials submitted and the approval procedures.

The third is to establish the filing system for Category II packaging. For the design of packaging for Category II radioactive material, the design unit shall submit the setting drawings and instruction, and the SAFETY ANALYSIS SHEET to the regulatory body for nuclear safety for record, before the first manufacture.

The fourth is to clarify management requirements for Category III packaging. The design unit should prepare certifications meeting with national safety standards and make records.

#### **2.2.2 Licensing management of manufacture of transport packaging**

To strengthen the management of packaging manufacture, the Regulation made the following major provisions.

The first is to define the quality inspection requirements of transport packaging. The unit engaged in packaging manufacture shall conduct qualification test and establish qualification report of the manufactured packaging in compliance with the requirements of the design instruction and the national standards for safe transport of radioactive material. Any packaging unqualified or without qualification shall not be delivered for use.

The second is to define the conditions the unit engaged in manufacture of packaging for Category I shall meet. The following conditions are demanded, sufficient qualified professional; technical personnel who satisfy the need of the manufacture activities and the capabilities of fabrication and examination are comparable with the requirements of the manufacture activities.

The third is to establish licensing system of manufacture of transport packaging for Category I. The unit engaged in manufacture of packaging for Category I radioactive material shall apply for manufacture license of packaging for Category I, and conditions and process for license application are defined.

The fourth is to establish the filing system for manufacture of Category II and Category III packaging. The unit engaged in manufacture of packaging for Category II radioactive material shall submit proof documents to the regulatory body for nuclear safety for record. The manufacture unit of packaging of Category III radioactive material shall submit the list of types and quantities of packaging manufactured within the previous year, to the regulatory body for nuclear safety for record.

The fifth is to establish the coding system for manufacture of Category I and Category II packaging. The manufacture unit of packaging for Category I and II radioactive material shall, in a unified manner, give an identification number to each packaging.

### **2.2.3 Management of use of packaging**

To strengthen the management of packaging use, the Regulation made the following major provisions:

The first is the clear requirements of periodic surveillance and maintenance, all surveillance and maintenance record shall be documented and maintained. When the packaging reached its date of expiry or existed potential defect to the safe transport, the packaging shall be prohibited for use.

The second is to establish periodic evaluation system for Category I packaging. The user of packaging for Category I radioactive material shall carry out safety evaluation every two years, and submit the evaluation results to the regulatory body for nuclear safety for record.

The third is to establish approval system for Category I packaging manufactured abroad. To use for Category I packaging manufactured abroad, the user shall apply for approval from the regulatory body for nuclear safety before the first use. The regulatory body shall, in a unified manner, give an identification number to each packaging.

The fourth is to establish the filing system for Category II packaging manufactured abroad. To use the packaging for Category II manufactured abroad, the user shall submit to the regulatory body for nuclear safety for record before the first use. The

regulatory body shall, in a unified manner, give an identification number to each packaging.

### **2.3 Management of radioactive material transport**

To strengthen the management of radioactive material transport, the Regulation made the following major provisions:

The first is to identify requirements to consignor. The consignor shall possess effective certification of production, sale, use or disposal of radioactive material, use packaging appropriate for the category of radioactive material, equip with necessary radiation monitoring instruments, protective appliances and equipments against theft and sabotage, draw up and implement the shipping description, emergency response guide for the nuclear and radiological accidents, the loading and unloading procedures as well as the safety protection Guide.

The second is to establish monitoring system for the surface contamination and radiation level. To deliver category I radioactive material, the consignor shall entrust qualified radiation monitoring organization to monitor the surface contamination and radiation levels. To category II and III radioactive material, the consignor shall entrust qualified radiation monitoring organization to monitor the surface contamination and radiation levels. Any package of radioactive material shall not be delivered whenever the radiation monitoring report show non-compliance with the requirements of the national standards for safe transport of radioactive material.

The third is to classify qualification managements for carrier. Any carrier engaged in carriage of radioactive material shall obtain the qualification granted in compliance with the national regulations. The qualification of carrier shall be granted and controlled in accordance with relevant laws and regulations, and requirements by the department of the transport, the railways, the civil aviation, and the postal.

The fourth is to establish SAR (Safety Analysis Report) System. Before transport of category I radioactive material, consignor shall submit the ratifications for the nuclear and radiation safety analysis report.

The fifth is to define specific requirements for different kind of transport. Transport of radioactive material by road shall be approved by the public security organization, and conducted in accordance with the approved time, routes, speeds, with warning marking and the escort personnel, to make the radioactive material under the supervision of escort personnel. Transport of radioactive material by water shall be conducted in accordance with relevant provisions of law and regulations on the waterway transport of dangerous goods. Transport of radioactive material by railway or air shall be conducted in accordance with relevant provisions of competent department for railway and civil aviation under the State Council.

### **3. Regulatory system of radioactive material transport**

Implementation of the Regulation is important to regulate transport management, to reduce the transport risk, to promote development of nuclear energy, nuclear technology and peaceful use, and to protect public and environmental safety.

After the Regulation was promulgated, the National Nuclear Safety Administration (NNSA) have developed (or intended to develop) a series of department rules, regulation guide and standards. Then the legal system will be formed, the Regulation as the core, Licensing Management for the Safe Transport of Radioactive Material,

Supervision Management for the Safe Transport of Radioactive Material and other safe transport rules as the supports.

Licensing Management for the Safe Transport of Radioactive Material was promulgated by NNSA on September 25, 2010 and went into effect on November 1, 2010. Meanwhile, the Classification and Catalogue of the Radioactive Material has been approved by NNSA and other relevant departments and gone into effect on March 18, 2010.

Now Supervision Management for the Safe Transport of Radioactive Material and programs under Licensing Management are under setting down.