

COMPLIANCE ASSESSMENT FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL. RUSSIA PRACTICE AND PERSPECTIVES.

Ershov V.N., Novikov G.A.

FGUP "Emergency Response Centre of Minatom of Russia", St.-Petersburg, Russia
Paper for International Symposium "Packagings and Transport of Radioactive Material",
PATRAM - 2010, 3-9 October 2010, London, Great Britain

1. INTRODUCTION

"Regulations for the Safe Transport of Radioactive Material," IAEA [1] establish safety requirements for shipments of radioactive materials (RM), which are currently used almost all countries without significant deviations. These requirements are detailed sufficiently, so that their interpretation and criteria of their implementation is not controversial and do not create much difficulty in the interaction of transport participants, including in international shipments.

At the same time, the Regulation almost no define the subjects and conditions to monitor and confirm compliance. Regulations and other documents of the IAEA, e.g. Safety Guide TS-G-1.5 «Compliance Assurance for the Safe Transport of Radioactive Material» [2] basically operates one control body - the competent authority, and mainly in the issuance of certificates of approval. However, in practice of the countries the various functions of safety control for shipments are carried by several state agencies and authorized organizations.

Therefore, without a clear distribution of responsibility and control form and procedures, it is impossible to avoid duplication, time and documents inconsistency of such procedures that affects the efficiency of the organization and implementation of shipments, initiates delays and denials of shipments. If to take into account that the recent time requirements for security of transport and the requirements for the control of their performance are increased, the importance of optimization of compliance in this area is obvious.

In Russia, the whole set of actions to monitor and validate compliance of danger activities is determined (in accordance with the Federal Law "On technical regulation" [3]) as a "conformity assessment" - "a direct or indirect identification of compliance requirements for object. The law identified the various forms of conformity assessment, namely: state control (supervision); accreditation; testing, registration, certification, declaration, inspection and commissioning of the facility, etc. The law does not restrict the use of other forms of conformity assessment.

This report presents the results of the analysis of conformity assessment in the transport of RM in Russia, including comparison with the recommendations of the IAEA and other countries' experiences, as well as the directions of modernization of the system. It seems that the information and conclusions contained in the report will be useful for professionals of transport related RM in Russia and/or from Russia, as well as international organizations, including the IAEA, as in regulating the shipments and as in the developments of Agency documents on RM safe transport.

2. THE CURRENT SYSTEM OF CONFORMITY ASSESSMENT

The main forms of conformity assessment to confirm the implementation of various requirements related to safety during RM transportation in Russia and the state authorities or authorized organizations conducting such conformity assessment, are presented in

Table 1.

Table 1

Forms of conformity assessment on the safety of transportation of RM in Russia

No.	The form of conformity assessment	The state body or organization authorized
1	Licensing of activity in the nuclear field (consignor, consignee, carrier, designer and manufacturer of packaging, expert organization)	Rostekhnadzor
2	Licensing of transportation and re-loading dangerous goods (the carrier, ports, stations, etc.)	Ministry of Transport
3	Certificates of approval for designs of SFRM, LDRM and packages	SC "Rosatom", Rostekhnadzor, Ministry of Health
4	Sanitary-epidemiological conclusion on SFRM, LDRM, packaging, vehicles	Ministry of Health
5	Certification of compliance of manufacturing packagings, including consideration of quality assurance programs in manufacturing	Certification organs accredited by Rostekhnadzor and SC "Rosatom"
	Certificates of approval for shipments of type IP-2, IP-3, A, B, C, F and UF6 packages	SC "Rosatom", Rostekhnadzor, Ministry of Health
7	Agreement of transport routes and convoying	Ministry of Internal Affairs
8	Agreements of emergency plans of consignors	SC "Rosatom"
9	Declaration on the implementation of safety	Consignor
10	Control inspection to verify the conditions of the licenses, certificates, sanitary-epidemiological conclusion	Rostekhnadzor SC "Rosatom" Ministry of Health

The comparison of forms used for conformity assessment in the nuclear field in general and in RM transport with similar systems for the transport of other dangerous goods and other activities involving hazardous materials in the country, shows that for the transport of RM such forms much more than for other DG and other areas. In particular, the transport of other DG does not require licensing organizations that are designing and manufacturing equipments including transport packagings. Also for the other DG system of sanitary-epidemiological conclusions issued by Ministry of Health is used considerably less. The state system of emergency response for transportation of other DG does not provide for agreement of emergency plans of consignors. Also for the other DG it is not required to certify manufacturing packagings and certification of packagings design carried out through the certification of the head samples.

Detailed examination of the forms of conformity assessment for RM transport indicates the presence of many duplications. In particular, it is the case with regard to designing and design of packagings where there are:

- licensing activities of the designing organizations provided by Rostekhnadzor (Supervision body in atomic field). The conditions of the licenses foresee for review by the supervising authority of packaging design elements during designing and the whole design;
- issuance of sanitary-epidemiological conclusions on the packagings from the

Ministry of Health. It focuses on technical specifications and other design documents for packagings from the point of view of radiation shielding and radiation dose at works;

- issuing certificates of approval for package designs from State corporation "Rosatom» (state competent authority for RM shipments) in agreement with the Ministry of Health and Rostekhnadzor. Expertize for certificates consist of consideration of all design documents for the packaging including test results, calculations, etc.;

- certification of packaging manufacturer. During the certification design of packaging, the test results in designing and manufacturing, as well as manufacture procedures and program of quality assurance in manufacturing are considered.

As we see, for one object of regulation in one way or another four checks (forms of conformity assessment) and as the fifth - declaration of the consignor are used. Of course, the reliable design of packaging is a key concept element of RM transport safety and to some extent overlap control may be justified. However, it appears that in this case there is too much overlapping.

Comparison with the IAEA recommendations also shows the presence in Russia of a more rigorous conformity assessment system. For example there are licensing all consignors and consignees (as operators), but not the use, for some RM, of more milder forms such as registration and notification of activity. Issuance of certificates of approval for designs of Type A packages, as well as virtually issuance of such certificates for shipments of all types of packages. Application of sanitary-epidemiological conclusions that are not provided by IAEA recommendations. In general, the system does not almost use a grade approach to forms of conformity assessment, based on the level of hazard of the object, as it is recommended by IAEA.

Also, comparison was made with accessible data on conformity assessment in other countries, including the data of the IAEA missions on appraisal for states of safety on the RM transport [4] - [7]. We can not guarantee that the available foreign data are complete or that we interpret them adequately. Nevertheless, it appears that Russian demands for conformity assessment more stringent and the number of forms of conformity assessment is much more than in other countries. I think that the symposium participants can confirm this conclusion comparing the above information with the practice in their countries.

What conclusions can be drawn from the analysis? From the perspective of the final result - safety, we can say that there is sufficient reliability of the existing system of conformity assessment. In Russia, as in the whole world record of safety has been reached. In fact, there were no cases of unacceptable radiological impact due to transport of RM, including the actual accidents during transport. That is, seems to be no need to change something.

At the same time, there are obvious options for improving the system and for its internal harmonization and harmonization with international approaches and requirements. Federal Law "About Technical Regulating" also found that the characteristics of conformity assessment in the field of atomic energy, including the transportation of radioactive material must be established by the Government and should be documented as the entire set of forms of conformity assessment.

3. DIRECTIONS OF MODERNIZATION OF CONFORMITY ASSESSMENT SYSTEM

Taking into account the results of analysis of the current conformity assessment system in the light of international experience and recommendations of the IAEA basic approaches to change the conformity assessment system on the transport of radioactive material were to be as follows:

- reduction of activities types requiring licensing (according to Russian laws, international practices and recommendations of the IAEA);
- replacement of licensing by registration or notification of the activity for organizations engaged in transporting low activity RM;
- harmonization of the forms of conformity assessment with the forms used in other areas, primarily in the transport of other dangerous goods;
- avoidance of duplication of various forms of conformity assessment;
- more close harmonization of the forms of conformity assessment with the forms used in other states and recommended in the regulations of IAEA;
- using a graded approach to forms of conformity assessment, based on the level of potential risk of RM consignment;
- more wide using forms of self-declaration, self-certified carried out by operators.

At the same time task was to stay as far as possible within the current legislation in the field of atomic energy, radiation safety, transport, and technical regulating. As a result of elaborations the changes have been proposed to the current system, which are summarized in Tables 2 and 3.

Table 2

The proposed forms for conformity assessment
in designing and manufacturing RM and packagings

Forms of conformity assessment	Types of RM and packages						The state body or organization authorized
	S F R M	L D R M	Exp IP1	IP2 IP3 A	B, C, UF 6	F	
Declaration of design conformity			+				Designer
Declaration of design conformity				+			Designer together certification organs
Certificate of approval for design	+	+			+	+	SC“Rosatom” , Rostehknadzor
Licensing manufacturer		+					Rostehknadzor
Registration of manufacturer	+						Rostehknadzor
Certification of quality syaytem of manufacturer	+	+			+	+	Organs of certification
Licensing the expert organization	+	+			+	+	Rostehknadzor
Accreditation of organs of certification	+	+		+	+	+	SC“Rosatom” , Rostehknadzor

Table 3

Proposed form of conformity assessment at exploration (shipments)

Forms of conformity assessment	Types of packages				The state body or organization authorized
	Exp IP1	IP2 IP3 A	B, C, UF ₆	F	
Licensing consignor			+	+	Rostekhnadzor
Registration of consignor		+			Rostekhnadzor
Notification of consignor activity	+				Rostekhnadzor
Licensing carrier	+	+	+	+	Ministry of Transport
Registration of RM carrier			+	+	Rostekhnadzor
Notification of carrier activity	+	+			Rostekhnadzor
Licensing re-loading works	+	+	+	+	Ministry of Transport, Rostekhnadzor
Sanitary-epidemiological conclusion on works with RM packages at consignor and consignee		+	+	+	Ministry of Health
Certification of vehicles	+	+	+	+	Ministry of Transport
Certificate of approval for shipment		+	+	+	SC“Rosatom” Rostekhnadzor
Declaration of consignment conformity	+	+	+	+	Consignor
Licensing expert organizations carrying out safety expertize at issuing certificate of approval		+	+	+	Rostekhnadzor

As it can be seen from tables 2 and 3, in the proposed system such forms of conformity assessment as licensing the designing and manufacturing packaging and other equipment are completely excluded. The system of sanitary-epidemiological conclusions for packaging and vehicles replaced by the assessment of radiation safety in the transport, i.e. the conclusion on the radiation safety program as it is foreseen in IAEA regulation. Agreement of road transport routes are excluded. Much more the grade approach is proposed.

It should be noted that the proposed changes do not ensure complete elimination of duplication of control of the object regulated. They virtually eliminate the presence of several permit document in general for object (license, certificate, sanitary-epidemiological conclusion, etc.). To avoid duplication of control the specific requirements it is necessary to compile a complete list of safety requirements and for each requirement to determine the form and procedure (rule) of conformity assessment, as provided by federal law [3]. Then you can group the conformity assessment procedures on the forms (licensing, certification, etc.).

For example, the availability and adequacy of the emergency plan or program of radiation protection can be checked at licensing, but may be in issuing the certificate of approval for transportation. Also, in particular, it should be clearly defined, what is checked in the licensing of the carrier of dangerous goods by Ministry of Transport, and what — at registering the carrier by Rostekhnadzor. And so on.

4. CONCLUSION

Main provisions prevailing in Russia of conformity assessment system in the area of transport safety of radioactive material are presented. It seems that this system, although it provides the necessary level of safety, is too complicated, some elements of the system unnecessarily duplicate each other. Comparison with the IAEA recommendations and practices of other countries shows that there may be some simplification of the requirements and reducing the number of forms of conformity assessment. In this direction works are carried out and changes are suggested.

Despite the fact that, in contrast to the technical requirements for safety, conformity assessment systems used in countries are more dependent on national conditions, it is useful to develop common international standard (recommendations) on set of forms and rules of conformity assessment in the field of safety of radioactive materials transport. Obviously, such work should be organized in the framework of IAEA.

5. REFERENCES

- [1] INTERNATIONAL ATOMIC ENERGY AGENCY. Regulation for the Safe Transport of radioactive material. Edition 2005. TS-R-1. IAEA, Vienna, 2005.
- [2] INTERNATIONAL ATOMIC ENERGY AGENCY, Compliance Assurance for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. TS-G-1.5, IAEA, Vienna (2009).
- [3] Federal Law “About Technical Regulating”, 2.12.2002, No.184-FL.
- [4] Appraisal for the United Kingdom of the Safety of the Transport of Radioactive Material. IAEA Safety Standards Applications – TranSAS –3. IAEA, Vienna, 2002.
- [5] Appraisal for France of the Safety of the Transport of Radioactive Material. IAEA Safety Standards Applications – TranSAS –6. IAEA, Vienna, 2004.
- [6] Appraisal for Japan of the Safety of the Transport of Radioactive Material. IAEA Safety Standards Applications – TranSAS –7. IAEA, Vienna, 2006.
- [7] Appraisal for Brasil of the Safety of the Transport of Radioactive Material. IAEA Safety Standards Applications – TranSAS –2. IAEA, Vienna, 2003.