Experiences for the Safe and Secure transport of Radioactive Material in Islamic Republic of IRAN

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ABSTRACT:

The Iranian Nuclear Regulatory Authority (INRA) has been addressed the actions to be taken in respect of the safe and secure transport of radioactive material. Firstly, INRA translated TS-R-1 and approved it as national standard and imparted it to all entities that engage in transport of radioactive material. Training course was provided for the designers, consignors, carriers and consignees based on their actions in transport of radioactive material. All radioactive material carrier companies were enforced to observe all aspects of national standard and receive an authorized license of National Radiation Protection Department (NRPD). The NRPD has written procedures to regain control of the radiation sources together with the National Waste Management Department. Transport arrangements are in place for imported and exported sources. According to the Code of Conduct on safety and security, the sources category I, II and III have been registered in data bases carefully so far. All the licensees are obligated to inform the Regulatory Authority for any changes in position, application, possession, transfer or waste of radiation sources. There is a formal agreement with the National Security Council to permit the import of scrap metal at major entry points on the borders. Scrap metal importers are required to use these points of entry which are monitored by officers of the NRPD and portal gate monitors which are installed at the main entry points and be controlled from unique centre. If required, the NRPD will supply staff to other border entry points. Presently some portal gate monitors are in progress at the borderline customs also. All the major metal recycling facilities in IRAN have installed portal gate monitors to recheck their scrap metal imports.

Introduction:

Atomic Energy Organization of IRAN (AEOI) was established in 1973 and National Radiation Protection Department (NRPD) as a part of Iranian Nuclear Regulatory Authority (INRA) in AEOI debuted. The radiation protection act ratified in 1989 and NRPD undertook the supervising all activities related to the radiation protection as national regulatory body. Safety and security of radiation sources is one of the most important NRPD duties. The preliminary acts were started after the first assistance of Iranian representative in Transsc 11. We translated TS-R-1 [1] and accepted it as the national standard for the safe transport of radioactive material. Then, we tried to train the corresponding persons, based on their actions in transport of radioactive material. All radioactive material carrier companies were enforced to receive an authorized license of NRPD. An inventory system was obtained to register radiation sources and any changes in their conditions. According to the Code of Conduct [2], the NRPD has written procedures to manage the wastes.

The radioisotope suppliers in Iran were enforced to design, test and label their packages as standard. The carriers were informed to accept the packages that are complied with standard. The radiological incidents related to scrap metal in different countries have been caused the extreme financial and public loss. The radiological accidents in Ciudad Juarez (Mexico 1983) with 34 M$ cost and Goiania (Brazil 1987) with four dead persons are the most serious accidents [3]. For control of scrap metal in ports, the portal gate monitors installed at 7 main entry points.

Training course:
Training course was provided for the entire corresponding persons, based on their actions in transport of radioactive material. The main targets were the designers, consignors, carriers and consignees. The base of instruction stands on the standards for the safe transport of radioactive material (TS-R-1). The most important items are:

1. The nature and definition of radioactive material.
2. The specification of different types of packages.
3. Designing, labeling, placarding and the tests for packages type A.
4. Quality assurance program.
5. Emergency procedures.

More than 50 relevant persons trained in this case.
The scrap metal inspectors have been trained so far. "Inspection procedure in scrap metal" is the main training for the inspectors which contain the inspection method, dealing with suspect consignments and the emergency procedures. Now, 10 trained inspectors operate the imports and clearance of scrap metals.

Portal Gate Monitors:
Some portal gate monitors and crane detectors are installed at the major borderline customs and harbors. Presently some portal gate monitors are in progress at the borderline customs also. All the major metal recycling facilities in IRAN have installed portal gate monitors to recheck their scrap metal input. Figure 1 shows the portal gate monitor is installed at the one of the borderlines in IRAN. There is a formal agreement with the National Security Council to permit the import of scrap metal at major entry points on the borders. Scrap metal importers are required to use these points of entry which are monitored by officers of the NRPD and portal gate monitors which are installed at the main entry points and be controlled from unique centre.

Fig 1. Portal Gate Monitor is installed at the borderline

Carrier Companies:
The radioactive material carrier companies were enforced to receive a license from NRPD. For this purpose, every company must have the trained staff, proper equipment and relevant code of practices for the safe transport of radioactive material. The license will be issued after surveying in place. 2 main carrier companies are authorized in Iran.

Inventory System:
An inventory system (such as RAIS), was obtained to register the source information. According to the Code of Conduct on safety and security, the sources category I, II and III have been registered in data bases carefully so far. All the licensees are obligated to inform the Regulatory Authority for any changes in position, application, possession, transfer or waste of radiation sources.

Waste Management:
The NRPD has written procedures to regain control of the radiation sources together with the National Waste Management Department. All sources after their useful life either return to the supplier country or manage as waste. The national waste management is responsible for carrying and storage all unusable sources in special storerooms base on the nature and activities of sources. The orphan sources may cause the problems for public. NRPD will undertake the costs of transport and storage of orphan sources.

Suppliers:
The methods of package design and test, TI calculation and label selection by radioactive material suppliers were checked and the information for correcting their malfunctions was represented. The authorized carriers were notified to accept the packages which are complied with standard only.

Findings:
Many orphan sources and radioactive contaminated objects were found inside scrap metals consignments in recent years. Figures 2 show some cases of findings in scrap metal consignments which contain Eu-152 source, Densitometer and Industrial gamma projector. These objects are assumed as orphan sources and have been stored as radioactive waste. The findings are thereupon of the inspectors training and their experiences and acuities.

Fig 2. Some findings in scrap metal consignments

Conclusion:

The relation between member states causes the coactions by all countries. As, after attending Iranian representatives in Transcc sessions, a great familiarity with standards for the safe transport of radioactive material obtained. Hereafter, a salient growth in this branch acquired. Therefore, the multilateral cooperation between member states can achieve the safety and security of radioactive materials. In Iran, the cooperation between NRPD and suppliers & carriers has been caused that the learning and performance of the safe transport standards are ingratiated by the persons engaged in the transport of radioactive material. The change in cultural point of views between radiation workers is one the most important successes duo to actions which has been started from about 6 years ago in Iran.

The main items for having a good safety and security can be:

- It seems *IAEA* should take action in this regard and facilities the regional cooperation.
- Harmonized program should be established and performed in the member states.
- Since the orphan sources are an international problem and can effect many countries therefore the political issues should not interfere cooperation in this regards.

REFERENCES:

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