

Sri Lankan Experience on Control of Illicit Trafficking of Radioactive Sources

U. W. K. H. De Silva, H. L. A. Ranjith

Division of Radiation Protection & Regulations, Atomic Energy Authority, 60/460, Baseline Road, Orugodawatta, Wellampitiya, Sri Lanka

1) Introduction:

Atomic Energy Authority (AEA) which functions under the Ministry of Technology & Research of Government of Sri Lanka is the regulatory authority and responsible for controlling the utilization and ensuring safety and security of radiation sources and protection of general public in the country from unwarranted exposure to ionizing radiation. The AEA was established in 1970 under the Atomic Energy Authority Act No. 19 of 1969, and is empowered for licensing and inspection, authorization for transport, safe disposal and import / export of radioactive sources.

The control of radiation sources used in the country is achieved by annual licensing and inspection as per procedures established in the regulations titled "Regulations on Ionizing Radiation Protection of the Atomic Energy Safety Regulations No. 1 of 1999" promulgated in the year 2000 which conforms to Basic Safety Standards - 115.

2) Method:

- A portal monitoring detecting system (Mega port screening system) has been installed at the Colombo port for detection of unauthorized radioactive materials (illicit trafficking), as an activity of regulatory control of radiation sources, (Import & export control of radioactive materials).
- This detecting system is operated & managed by the Customs Department of Sri Lanka with the technical assistance of National Security Administration of Department of Energy of the U.S.A. government.
- The radioactive materials or contaminated items which emit gamma or neutron radiation can be detected by this system.
- Portal monitors are installed in 11 gates at the Colombo port and all in coming, outgoing & transshipment containers are screened.
- The organizations involved are Department of Customs, Sri Lanka Ports Authority, Sri Lanka Navy, AEA and Central Environmental Authority. The AEA is responsible for analysis and advice on remedial measures if unauthorized radioactivity is detected by scans.

3) Results:

Two incidents have been reported of detecting the items contaminated with the radioactive materials by the portal monitors installed in Colombo Port.

Incident 1:

- Transshipment container filled with scrap metal bound for India (by a ship from Benin) was detected radioactive while transporting through portal monitors on 10th January 2008.
- The AEA carried out an inspection and radiation levels were measured outside the container without opening it. The nuclide analyzer (Na/Tl) indicated neutron and gamma radiation and confirmed presence of Cs-137.
- Further measurements with portable pure germanium nuclide analyzer confirmed the presence of Am-241 & Cs-137.
- The maximum radiation level measured outside the container was 23 μ Sv/h. It is assumed that the instrument could be a moisture gauge containing Am / Be and a Cs-137 source.

Incident 2:

- A container of copper bonded grounding rods bound for U.S.A. (by a ship from Kolkata, India) was screened by portal monitors and found that content of the consignment is radioactive on 19th January 2007.
- AEA carried out a detailed analysis and confirmed that the items are contaminated with Co-60 radioactive material.
- Few of those copper bonded earth rods were highly contaminated. The activity concentration is 203468 ± 6258 Bq/kg.
- The rest were slightly contaminated. The activity concentration is 10.12 ± 1.37 Bq/kg.
- Highest radiation level of the surface of a highly contaminated rod was measured as $285 \mu\text{Sv/h}$.

After confirming the items are contaminated with the radioactive materials, steps were taken to send back the relevant transshipment containers to the original suppliers according to IAEA transport regulations [Safety Standard Series No.TS-R-1 (ST-1 Revised)]. The incidents were communicated to the IAEA through Illicit Trafficking Database (ITDB) program.

4) Conclusions:

At present all the scanning portal monitors are satisfactorily functioning and control of unauthorized movements & contaminated items of radioactive materials are guaranteed within the port of Colombo, Sri Lanka.