

Wake-up call from Mayapuri

► *The leakage of the highly radioactive cobalt-60 in Delhi raises questions about the trade in such materials and how their movement escapes detection.*

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The recent incident in the Mayapuri industrial area of Delhi, where five persons suffered high radiation doses due to accidental exposure to highly radioactive cobalt-60, should be seen as a wake-up call for tightening security and accountability in respect of radioactive materials.

Cobalt-60 is a highly active man-made isotope of Cobalt, a metal which is known for the attractive pink colour of many of its compounds. This material has many applications – radiation therapy, industrial radiography, sterilisation of food, measuring instruments, and laboratory uses. Because Co-60 is so highly radioactive, it must be shielded in lead containers, handled very carefully, and accounted for from “cradle to grave”. The Atomic Energy Regulatory Board (AERB) monitors compliance with safety requirements.

In the latest incident, Co-60 in the form of wires was part of a scrap consignment. Efforts are on to trace the origin of this material, as the disposal of Co-60 containing material as scrap is strictly prohibited. No doubt those responsible will do all they can to cover up the traces.

If the scrap was imported, it raises serious questions on safety in the trade of scrap, where several incidents of toxic materials have also been reported.

The persons who unknowingly cut open the container of Co-60 received strong radiation doses, causing symptoms of radiation sickness which at

that time were not recognised. The material was then stored in the office of the scrap dealer for nearly a month, during which all persons who visited or worked in the office received radiation doses.

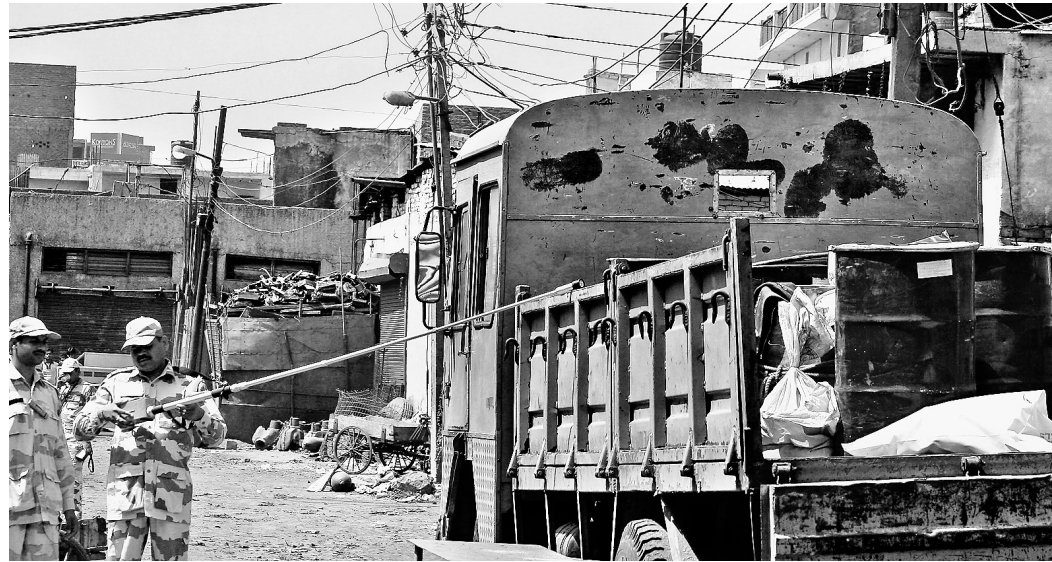
Gamma radiation is a silent, insidious killer which does not announce itself, unlike other dangerous chemicals. The radiation gets continuously absorbed by the body, causing mutations which could lead to cancer, and death of cells. It is intensely penetrating (unlike the alpha and beta radiation which is stopped easily) and requires thick lead to stop it. By the time symptoms of radiation sickness become manifest, the dose absorbed is already far above the safe level.

INTRIGUING ISSUES

Many questions need to be resolved in this case. Had any radioactive material included in the scrap already been disposed of since early March? If so to whom and for what purpose?

What was the origin of the scrap – domestic or imported? All scrap acquired over the past month needs to be traced back and investigated to find out who was responsible for the disposal of Co-60 containing scrap. Was any contaminated scrap sold and processed into steel products? Has any quantity of Co-60 spilled out of its container and got dispersed?

It is important to ensure that there has been no leakage of radioactive material into other products of scrap recycling by accounting for the Co-60 up to the highest possible accuracy.



Deadly scrap.

As mentioned before, smaller amounts of Co-60 could have leaked out and handled without giving rise to any visible symptoms.

Is this an isolated first case, or has this been happening earlier and only detected now? Were any previous consignments of scrap acquired from institutions using radioisotopes, and if so are all such material duly accounted for?

If the material came in as imported scrap, from where did it come and how was it processed through export and import channels without detection of radiation? The authorities in the country of export would need to be involved in such a case.

ACCIDENT IN MEXICO

The authorities would be well advised to revisit the case of Co-60 leakage from a junked radiotherapy machine, which occurred in 1983 in Mexico, resulting in spread of this material into 600 tonnes of steel products which ended up in 23 US states, Mexico, and Canada. In one of the worst radiological

disasters in US history, contaminated steel products and reinforcing bars had to be tracked down. Some 100 homes in Mexico had to be destroyed as they used contaminated steel bars.

The US Nuclear Regulatory Commission (NRC) reported that it is notified of about 200 lost or stolen radioactive sources each year and that since 1983, 20 sources had been accidentally melted at steel works and other foundries.

According to other sources, 65 meltings have occurred worldwide. IAEA says it is aware of 49 meltings worldwide in 1998. Also worth studying are the European Commission's technical guidelines on the future management of scrap metals arising from the decommissioning of nuclear sites.

RADIOACTIVE MATERIAL

Despite availability of instrumentation, it is quite possible for radioactive material to pass through undetected if it in thin wires or powder form and is encased in lead containers –

this is a technical problem container security experts have been trying to deal with. The scenario of terrorists shipping in radioactive materials for subsequent dispersal in populated areas is one we have to deal with.

For example, Co-60 could be easily converted into soluble chemicals, diluted and introduced into drinking water supplies.

The case is complicated and needs a combination of determined police work and technical expertise to resolve the host of issues involved. The AERB must be strengthened to handle this task.

No equipment should be disposed of as scrap without approval of the AERB or its delegated authority. Scrap dealers should be sensitised to be cautious and report any suspicious containers, especially of lead, that might contain radioactive material.

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