Unintended consequence – Radiation Monitoring

In the past few months, a number of containers arriving on the West Coast (BC) from the Far East; on passing through the CBSA radiation detection portals, installed at the ports of entry; triggered radiation alerts.

Prior to the installation of these portals, such consignments could have easily passed into Canada and reach the ultimate consignee without any action being taken. Radiation exposure could have been a potential issue, depending on the level of activity. This has all changed as a consequence of 9-11.

These units were deemed to have a radiological emitting source, above normal background levels. The specific level of radioactivity varied. Subsequently on closer investigation the existence of “hot spots” inside the container was confirmed. None of the containers contained a declared radiological source. We make no comment about the degree of risk this elevated activity level poses as there are many mitigating factors.

Note: This radioactivity should not to be confused with the issue of surface contamination of containers which occurred during the initial stages of the Japanese Fukushima nuclear incident.

It was determined that the radiation emitting from these containers exhibited the signature for Cobalt-60. Non-radioactive cobalt occurs naturally in various minerals, and has been used for thousands of years to impart blue color to ceramic and glass. The radionuclide, cobalt-60, is produced for commercial use in linear accelerators. It is also produced as a by-product of nuclear reactor operations, when structural materials, such as steel, are exposed to neutron radiation.
The metallic housings used for Cobalt-60 sources can often get mixed in with scrap metal and pass undetected into scrap metal recycling facilities. If melted in a mill, they can contaminate the entire batch of metal and the larger facility, costing millions of dollars in lost productivity and cleanup costs.

In each of these cases (both FCL/LCL consignments) the source of the activity was deemed to be coming from metal products. In one case it was stainless steel shelving, in another it was metal garden furniture and ornaments, in at least one other it was steel tubing or valves and related steel products. In one instance the welds were the source. It is thus believed that in all cases the source was from some contaminated base metal used in the manufacturing process.

While there was no evidence of cross contamination, meaning that neither the container nor the other cargo present in the container became radioactive, there was exposure to the radiological source.

In all cases, the CBSA in conjunction with the CNSC advised the importer/forwarder of the inadmissibility of the container into Canada, with instructions to either return to point of origin, or to engage the services of a radiation expert to determine resolution options.

In the first instance return to origin in not a realistic option since most carriers would outright refuse to transport. Further the IAEA transport regulations could not readily be complied with and the country of origin would likely refuse entry.

The other option and the main purpose behind this article is to alert readers to the very significant remediation expenses that they could be subjected to. First would be then need for a thorough investigation of the source and the specific levels of radiation. Next would be the development of a plan for the removal of the source and its ultimate disposition at an approved treatment facility.

Because of health and safety requirements, special precautions, equipment and expertise must be deployed and the ultimate destruction of the source. Costs are ASTRONOMICAL, consider a starting point at about 100,000 $ and more.

Importers/Forwarders are alerted to the need to ascertain and obtain assurances that metal type products imported into Canada are free from undeclared radiological sources. The end game scenario is that the importer/forwarder in Canada could be faced with significant costs, loss of business and claims from innocent clients involved in consolidated cargoes and for demurrage/storage and other associated costs.
The long established rule of “KNOW YOUR CLIENT” is essential in this case. Whenever metal products are being transported, obtain confirmation of no undeclared “radiological” sources and that should there be issues similar to what is portrayed here that all/any consequences would be for the clients account.

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