SESSION III - Compliance with radiological criteria: Monitoring, characterization and good operational practices

In this session, criteria relevant to the release of metals from nuclear regulatory control were presented and methods for complying with the criteria and for detecting radioactive materials in scrap metal were discussed.

It was argued that, over time, radionuclides will inevitably find their way into commodities, that the issue is global and that internationally acceptable criteria are therefore necessary to allow international trade. An intergovernmental consensus on levels at which materials can be released from regulatory control (clearance levels) exists - as set out in IAEA Safety Standards Series RS-G-1.7 (2004). However, the existing scheme is complex and for global application it should be simplified.

The need for the monitoring and control of the radioactive materials in scrap metal at the borders of countries as well as at the entrance to scrap yards and metal factories was stressed in several presentations. In this context, the ongoing efforts of the USA, in the context of the safety and security of radioactive materials, to install radiation monitoring systems at more than 100 major entry points (Megaports) all around the world were described. It was noted that when radioactive materials are detected at the Megaports the local regulatory response arrangements differ substantially from country to country and it would be desirable for a more globally unified response approach to be developed.

In a presentation discussing the sensitivity of scrap metal monitoring systems, and specifically portal or gate monitors, it was noted that the detection of radioactive material depends on the energy of the radiation source, its position in the load and the density of the metal scrap. Significant radiation sources can be 'hidden' in loads by being shielded by surrounding metal and thereby escape detection. In most cases the triggering of an alarm at a portal monitor is sufficient for a scrap metal facility or metal factory to reject a load. An important finding is that for ^{60}Co uniformly distributed in a load at the international clearance level, typical portal alarm monitors will not be triggered.

A basic problem in managing the problem of radioactive material in scrap metal is that the workforce of scrap metal yards, metal factories and those responsible at borders are unfamiliar with radiation and on how to work safely with it. Several papers stressed the need for training of the personnel who are most likely to encounter the problem of scrap metal containing radioactive material.

In the panel session after the presentations the following points were made:

The subject matter of the conference can be seen as being comprised of short-term issues, that is, the prevention, detection and response to radioactive material entering scrap metal where the source is mainly NORM and orphan sources, and longer-term issues concerned with the eventual inevitable presence of low levels of radionuclides in the steel pool. For this it will be necessary for an understanding to be reached between the nuclear and steel industries. To facilitate this it was proposed that an international forum be established which the two sides could exchange concerns and ideas for their solution.

It was noted that there are already some international instruments in existence that could be used to address some of the issues raised at this conference. The international Regulations on the Safe Transport of Radioactive Material were cited as one example.

The existing international clearance criteria are expressed in terms of activity concentration in materials. For the purposes of practical application in detection systems, the criteria need to be in terms of the quantities that are measured, that is, gamma radiation dose rates in excess of natural background. Guidance on this aspect would be useful - recognizing that the actual numbers will tend to be equipment and location specific.