RADIOACTIVE SCRAP METALS

24 July 2000

INTRODUCTION

This briefing note is based on a fully annoted 15 page status report on the increasing incidents and dangers of radioactive sources and contaminated metals entering the feed stock of the metals recycling industry. This trend is recognised by the International Atomic Energy Agency (IAEA), World Customs Organisation, Interpol, the European Commission and regulatory agencies here.

Failure to prevent sources and contaminated materials entering the feed stock results in a heavy financial cost being carried by the metals recycling industry and a radiological hazard to workers, the public and the environment.

INCIDENTS

On some accounts, 65 meltings of radioactive sources or contaminated metals have been reported world-wide. Up to 1998 the IAEA said it was aware of 49 meltings world-wide "...an increase of 40% within the last two years....This situation is aggravated by increasing amounts of scrap originating from decommissioning of nuclear reactors, weapons and submarines."

IAEA say that in 1998 it was notified of 27 'major' incidents. Since February 1999 the Environment Agency for England and Wales says it has received 15 unofficial reports of radioactive materials turning up at scrap yards. In the US the Nuclear Regulatory Commission (NRC) says the 200 reports of lost, stolen or abandoned radioactive sources it receives each year probably represents the 'tip of the iceberg'.

ORGANISED CRIME

Interpol believes organised crime is selling on contaminated metals to unsuspecting scrap dealers. Reports of organised crime's involvement in contaminated scrap dealing come from the US, Canada, Italy and Russia.

ECONOMIC COSTS

NRC say accidental meltings of radioactive materials in US steel mills costs on average $8-10 million per incident. The Acerinox steel plant incident in Southern Spain in 1998 cost $20 million in lost production, $3 million in clean up costs and $3 million for the resulting storage of 1,000 tonnes of contaminated wastes. The cost of the small Avesta Steel incident in Sheffield last May was estimated by the company to amount to about £2 million in lost production and clean up costs.

HEALTH AND ENVIRONMENTAL CONSEQUENCES

Once melted, contaminated metals have found their way into new products including: Skoda engine parts (cylinder heads); railway goods wagons; reinforcement bars and fittings in Taiwanese and Mexican buildings (irradiating occupants); and table legs exported from Mexico to the US.

CAN WE KEEP CONTROL?

Because of the above experience controversy surrounds the release from regulatory controls ('clearance') of lightly radioactively contaminated metals for reuse in consumer goods or for engineering or industrial purposes. Consequences are unforeseeable and it is impossible to quantify the cumulative health detriment from all the additional small radiation doses which people could receive from lightly contaminated consumer products if these became widespread.

CLEARANCE LEVELS

Clearance levels in the UK have yet to be determined. International efforts to standardise a threshold below which lightly contaminated materials could be 'cleared' for recycling has so far failed. The UK threshold for exemption from regulation of small quantities of materials used in specific practises is expected to continue at 0.4 Becquerels of activity per gramme of mass (0.4Bq/g). This is below the maximum levels permitted by the European Commission and has been welcomed by NFLAs for retaining radiological protection standards in the UK. Nonetheless, the nuclear industry is on record as openly seeking to reduce this protection so it can take more decommissioning wastes out of regulation and in so doing cut its long-term clean up costs.

PROBLEMS WITH CLEARANCE

The philosophy behind 'clearance' is 'dilute and disperse' - an extension of the approach taken towards marine/river and atmospheric discharges of radioactive wastes.

As with marine discharges, models are used to predict/estimate public dose levels but, as with marine discharges, new and unexpected pathways could emerge increasing public doses above predicted levels.

European guidance tries to establish clearance levels which will in future ensure any individual dose to any person is 'trivial' (ie. less than 10 microSieverts per year) but acknowledges the potential for individuals to encounter many 'trivial' sources which collectively 'may be substantial'.

Monitoring of contaminated materials cannot guarantee radiation protection. Coatings on metals can disguise actual levels of contamination and industry inspection regimes will not be foolproof.

If more radioactive scrap metals from nuclear installations are recycled, then there will be more radioactivity released to air through off gases in foundry processes, as occurred at Acerinox, and also on a vastly lower (but indicative) level, at Avesta Steel, Sheffield.

If more radioactively contaminated metals are introduced into the supply chain for the metals recycling industry, then there must be a risk that the current illegal trade in contaminated metals will be masked (and therefore unintentionally eased and encouraged).

The metal recycling industry itself recognises the harm which it could suffer if consumers become concerned about the safety of their products. The British Metals Federation and industry representatives in the US want no detectable radiation permitted in their products above normal background levels.

DETECTION ISSUES

Equipment costs is currently a disincentive to small scrap dealers and foundries installing comprehensive radiation monitoring equipment. Another serious disincentive results from the onerous liability for clean up resting with scrap dealers and foundries when contaminated material is detected. The temptation in some instances could be to simply not to try and detect at all. Another temptation could be to illegally and unsafely dispose of contaminated materials when detected.

Experimental detection schemes are being tried on the Continent to stop transboundary movements of contaminated scrap. None thus far have proved effective enough for wider implementation. Some radiation monitoring experts believe better systems using multiple detection methods and better intelligence flow between regulatory authorities internationally could increase successful interceptions. More can be done but Government will has to be found to do it.

CONCLUSION

The circulation of radioactive scrap is increasing and is likely to continue to do so with official European Commission encouragement for the free release of lightly contaminated material from civil or military nuclear decommissioning work. In order to protect the metals recycling industry, workers, the public and the environment, controls over the release of contaminated scrap should not be relaxed, and monitoring and detection in the scrap industry supplier chain needs to be stepped up.

ACTIONS

1. The NFLA Secretariat will investigate the potential for a national conference involving all 'stakeholders' to consider the issues raised in this briefing and how they might be more proactively addressed in the UK.

2. The NFLA Secretariat will continue to liaise with Steel Action, the local authority network promoting the interests of areas with metals industries.

3. Member authorities are asked to urge the Deputy Prime Minister and the Secretary of State for Trade and Industry to:

a) recognise the duty of the Government to support the metal recycling industry and ensure public confidence is maintained in the quality and safety of its products. The Government should assist the metal recycling industry to install monitoring equipment to better protect itself, its workers and the public from the dangers posed by contaminated metals and other radioactive sources.

b) introduce a scheme of compensation to assist traders and manufactures who are victims of environmental crimes involving attempts to place contaminated scrap or other radioactive sources in metals recycling feed stock and to review whether current arrangements for insurance otherwise apply to businesses affected, their employees and members of the public.

c) investigate the suitability of a national monitoring and detection scheme, similar to that introduced in Spain after the Acerinox incident, for implementation in the UK, but incorporating a scheme as in b) above.

d) investigate more sophisticated contaminated scrap detection methods, which have been identified by radiation monitoring experts, for installation in the UK, particularly at points of entry into the country.

e) maintain the present UK radiological threshold above which contaminated materials must be regulated and to resist pressure at both WTO or EU level to downgrade these.

f) Review the resources and regulatory powers available to the Environment Agency (England and Wales), the Scottish Environmental Protection Agency and their equivalents in Northern Ireland, and the Health and Safety Executive, to ensure the Agencies and Executive are able to respond appropriately to all reports of relevant occurrences without delay.

g) In connection with a) above, consider what industry standard equipment should be installed, and whether this should be described in published guidance issued jointly by the regulators referred to in f) above, or otherwise.

4. Member authorities are asked to convey their support to the British Metals Federation for its policy of 'zero tolerance' towards concentrations of radioactivity above natural background levels in recycled metals (address: Patrick Neenan MBE, Environmental Representative, BMF, 16 High Street, Brampton, Huntingdon, Cambridgeshire, PE28 4TU).

NFLA Secretariat
Town Hall
Manchester M60 2LA
Tel: 0161 234 3244
Fax: 0161 234 3379
email: nfznsc@gn.apc.org