
ENFORCEMENT PROBLEMS WITH RADIOACTIVE MATERIALS IN THE NATIONAL AND INTERNATIONAL TRADE IN METAL AND METAL SCRAP

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SUMMARY

In this paper we discuss the problem of the increasing import in the Netherlands of radioactive metal and metal scrap. The enforcement with regard to this subject is difficult and differs quite a lot from country to country. An overview of incidents in the Netherlands over the last five years is given. The outline of the enforcement policy from the Dutch Inspectorate for the Environment on this subject is discussed. International exchange of information and cooperation regarding enforcement is recommended.

1 INTRODUCTION

It is known for fact¹ that in a number of cases, radioactive materials have been incidentally processed along with metal scrap. Consequently, victims as well as substantial material damage have been reported. This has caused the major scrap metal processing and trading companies in North and South America to check the scrap metal supplied to them by using radiation detectors.

After some European companies started using these detectors, the Dutch Environmental Inspectorate has more frequently been informed about radioactive metal scrap being offered in the marketplace since 1990. Research into the nature of these products indicates that these are mostly composed of metal scrap which is contaminated with radioactivity of natural origin.

Radioactivity can contaminate the metal parts of installations that are part of industrial processes using natural raw materials. Examples are the fertilizer industry, oil and gas exploration and petrochemical industry.

Since 1990 it is compulsory for industries in the Netherlands to check all possible contaminated metal for the presence of radioactivity. In case the level of radioactivity exceeds the legal limit values, the specific metal needs to be decontaminated. Also in the Netherlands, a few major metal scrap traders have invested in radioactivity detectors since the middle of 1994. It is expected that more companies will follow this initiative. These investments have increased the number of reports to the government about radioactive metal scrap. In quite a number of cases the legal limit values were exceeded. A substantial part of these materials appeared to be from abroad.

The enforcement with regard to this subject, has been found to differ quite a lot from country to country. This applies to both the interpretation of the limit values as well as the way the legislation and directives are enforced. This article tries to point out the bottlenecks that occur during enforcement of the set regulation for the international trade of radioactive metal scrap.

2 LEGISLATION

2.1 General activities covered by legislation

In the Netherlands, the following activities regarding radioactive substances are prohibited: to prepare, to have, to use, import, transport and disposal, unless a permit has been granted or an exemption has been allowed in a directive regarding execution of the law. European Community regulations are implemented in the Dutch Nuclear Energy Law.

2.2 Limit values

For contaminated metal scrap of which the contamination exceeds 100 Bq/g, a permit is required. This limit value focuses on contamination and not at the specific activity involved the total metal object. Other limit values, such as maximum allowable surface contamination for beta, alpha and gamma radiation have not been laid down in Dutch law.

2.3 Disposal of radioactive waste

In the Netherlands COVRA (Central Organization for Radioactive Waste) has been appointed as the only legal collector of radioactive waste. Consequently all radioactive waste is in the end going to one location in the Netherlands.

3 DESCRIPTION OF INCIDENTS IN THE NETHERLANDS

Table 1 gives the incidents that occurred and for which action has been taken.

The first incident involved tubing that was found to be contaminated. This tubing has been used for oil or gas exploration, as a means for extracting oil or gas from the earth. This can cause radioactive substances to attach on the inside of the tubing. Tubing eventually is being sold and gets welded onto the outside edges of containers. These containers, which have an open top, are in use for the transport by lorries of several types of bulk materials like waste or agricultural products. Investigation pointed out that about 150 containers with radioactive tubing were used in the Netherlands. By now, all of these contaminated tubing have been taken off. Where possible the tubing will be sent back to the originating country. In such cases where this is not feasible, the tubing will be decontaminated, after which the radioactive waste gets disposed by the Central Organization for Radioactive Waste.

Following this incident in 1991, more incidents with contaminated tubing occurred throughout 1994 and 1995. In some cases the originating countries could not be tracked down. Manufacturers of containers have been given a warning regarding contaminated tubing and in case of further violation measures will be taken.

The remaining radioactive metal objects besides tubing mainly consisted of contaminated stainless steel, which is known to come, as far as can be determined, from the "process" industry. This for example includes screens, heat exchangers and valves. Once a radioactive nickel-catalyst was reported; it concerned a radiation level at twice as much as the background radiation. Analysis pointed out that for the catalyst no permit was required. Also once a quantity of melted depleted uranium was detected. Probably it had been a metal piece from process industry (e.g. a uranium catalyst) melted together with nickel and copper. At one time active nickel-copper, likely to have come from nuclear industry or from some accelerator, was sent back to its originating country.

Table 1. Contaminated product import into The Netherlands

Date	Country of origin	Metal	Material	Isotope	Bq/g	KBq	Action
1991	Germany	Fe	Tubing on containers	²³⁵ Pa etc.	2E3	6E5	Removed from containers
11-10-93	Finland	Ni-Cu	Activated pipes				Sent back
06-07-94	Dutch cont. shell	Fe	Tubing	²³⁵ Pa etc.	2E3	4E4	Cleaned
14-11-94	Morocco	Fe	Stainless steel	²³⁵ U etc.			Sent back
14-11-94	Morocco	Fe	Stainless steel	²³⁵ U etc.			Sent back
30-11-94	Morocco	Fe	Stainless steel	²³⁵ U etc.			Sent back
30-11-94	Morocco	Fe	Stainless steel	²³⁵ U etc.			Sent back
06-12-94	?	Fe	Tubing on containers	²³⁵ Pa etc.	2E3	2E4	Search for the rest, remove from containers & cleaning
05-01-95	Yuzbia	Fe	Stainless steel	?			Sent back
10-01-95	Israel	Fe	Screen	²³⁵ U	3E4	250	Selected/stored
13-07-95	England	Fe	Sprynozzle				Selected/stored
28-08-95	Russia	Ni 60%	Ingots/bars(Ni-Cu)	²³⁵ U			After research sent back
15-08-95	South-Africa	Fe	Stainless steel	?	?	?	Unopened sent back
20-10-95	Russia	Fe	Stainless steel	?	?	?	Unopened sent back
24-10-95	Germany	Ni	Catalyst	²³⁵ Pa	2	4	Processed
02-11-95	Russia	Fe	Heat exchanger	²³⁵ Pa			After research sent back
15-11-95	Russia	Fe	Tube with small tube inside				Selected/stored

^aNatural Uranium ^bDepleted Uranium

4 ENFORCEMENT IN CASE OF IMPORT OF RADIOACTIVE METAL SCRAP

4.1 Enforcement following a report from metal scrap trader

If a metal scrap trader detects a significant quantity of radioactive material when scrap has been offered, there are several possible alternatives. From these it is preferred by all parties including the Dutch government, that the whole shipment (often one or more sea containers) be refused by the addressee and sent back immediately to where it came from. When containers are sent back, the metal traders immediately inform the exporting company abroad and the Dutch Inspectorate. No further measures are taken unless the radiation level on the outside of the container is equal to or greater than 10 micro Sv/h and/or there are indications that it is a high radioactive source causing the increased radiation level. In these cases a further inspection will be necessary by an expert.

In these cases there is a reason to investigate the cargo. This has to be done by a company with the necessary expertise, with permission for such activities from the Inspectorate. This investigation is at the expense of the owner of the material. Any radioactive materials found in such investigation will be sent back to its originating country according directives determined by law or is being disposed of to the Central Organization for Radioactive Waste.

4.2 Enforcement after reports from third parties

Sometimes the Inspectorate is informed by others about suspected import of radioactive metal scrap. When this happens the Inspectorate will conduct an investigation; measures will be taken against the transporter and owner if limit values are exceeded.

4.3 Structured action plan for enforcement

Proactive, well organized measurements of all transports with metal and metal scrap that cross the border require much equipment and manpower with expertise. Thus only a very limited number of spot checks is possible.

This proactive way of enforcement by carrying out spot checks is used for shipments that come from countries where there is no sufficient legislation and/or enforcement on radioactive materials.

Also measurements and spot checks will be executed following information from abroad regarding suspected suppliers or suspected goods that are shipped to the Netherlands.

A structured action plan is being set up to put hold on the import of radioactive metal scrap. Such structured enforcement can only be realized through international information exchange and cooperation with other enforcers such as Customs. This action plan will also be communicated to and coordinated action is foreseen with the Inspectorate and other enforcers for chemical waste.

5 CONCLUSIONS

There is a problem regarding the illegal import of radioactive metal scrap. To prevent such materials from being traded in the Netherlands, Dutch companies have now the obligation to perform their own checking and/or decontamination of radioactive objects.

A structured action plan is being set up to put a stop to the import of radioactive metal scrap. International information exchange and cooperation with other enforcers is necessary.

6 RECOMMENDATIONS

It is recommended that in all countries legal measures are taken to ensure that industries check all possible contaminated metal scrap before export. Countries should inform importing countries about suspected traders and shipments. The exchange of information and cooperation regarding enforcement should be improved. Internationally the same measurement standards and limit values should be applied. In the international trade in metal scrap chemical contamination can be found too. Assistance in finding suitable solutions on the enforcement on radioactivity may be obtained from Inspectorate and other enforcers who are involved in the enforcement on chemical waste.

REFERENCE

1. Lubbenau, Joel O. and Yusko, James G., Health Physics, vol. 68, no. 4, April 1995, pp. 440-451