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COMMITTEE FOR TRADE, INDUSTRY  
AND ENTERPRISE DEVELOPMENTDistr.  
GENERAL

AD HOC GROUP OF EXPERTS ON STEEL

TRADE/STEEL/SEM.2/13(Summary)  
14 December 1998Workshop on Radioactive Contaminated  
Metallurgical Scrap

Original: ENGLISH

Prague, Czech Republic, 26-28 May 1999

RADIOACTIVE SOURCES AND CONTAMINATED MATERIALS IN SCRAP:  
MONITORING, DETECTION AND REMEDIAL ACTIONS(Prepared by R. Gallini, V. Berna, A. Bonora and M. Santini,  
U.O. Fisica e Tutela dell'Ambiente-PMIP-ASL, Italy)Summary

The scrap recycling in steel and other metal mills represents one of the most relevant activities in the Province of Brescia (Lombardy, Italy). In our Province more than 20 million tonnes of metal scrap are recycled every year by a melting process.

Since 1990, many accidents which took place were caused by the unwanted melting of radioactive sources, that were probably hidden in metal scrap. In 1993, the Italian Government stated directives to monitor metal scrap imported from non-EC countries because of the suspicion of the illegal traffic of radioactive materials. In 1996, a law imposed the control of all metal scrap, regardless of their origins.

Since 1993, our staff have controlled thousands of railway wagons and trucks. Approximately a hundred steel mills and foundries of aluminium, cooper, brass, etc. have also been controlled and many samples have been collected (flue dust, slag, finished products). During these controls, contaminated areas have been brought to light in two warehouses (Cs 137), in 6 companies (Cs 137 and Am 241), in two landfills of industrial waste (Cs 137) and in a quarry (Cs 137).

Up to now the contaminated areas have been cleaned, except for the last one. About 150 radioactive sources on contaminated materials have been found in metal scrap. We found radioactive sources of Co 60, Ra 226, Ir 192, Kr 85, Am 241, while the contamination of metals was mainly due to Ra 226.

The situation described above justifies an accurate control of the amount of scrap to reduce the risk of contamination of the workers in the working areas, in the environment and in the general public.

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MONITORING OF SCRAP LOADS AT GORZIA BORDER CHECKPOINTS:  
THIRTY MONTHS OF EXPERIENCE AND SOME SUGGESTIONS

(Prepared by M. Fabretto, Italy)

Summary

Scrap monitoring at border checkpoints with non-EU countries began in Italy in 1993. For a certain period of time, controls were performed by institutional organizations such as national health and firemen services. It soon became apparent that the amount of time required for manual inspection combined with the great number of vehicles to be monitored were considerably burdening the efficiency and prompt service. In 1996, the customs authority was given the possibility of entrusting controls to a "qualified expert in radioactive protection", as defined by the Italian legislation. In a rather short time, almost everywhere, controls were transferred to private institutions. Currently, scrap monitoring at terrestrial border checkpoints and important harbors is done by the experts or by trained personnel. At some places the service has to be operational 24 hours a day and every day of the year. This requires a high level of organization and only the private solution permits maintaining costs at a reasonable level.

The paper decides some important aspects deriving from this choice and makes some suggestions on how the experience already acquired can be used when more sophisticated automatic monitoring systems are eventually be installed at government border checkpoints.

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## SOME RESULTS FROM RADIOACTIVE CONTROL OF TRUCKS

(Prepared by K. Dollani, Institute of Nuclear Physics, Albania)

Summary

Three years ago, the Italian Police ordered the return of a Czech-made Skoda truck with Albanian tag because of the high gamma dose rate detected in the vehicle. The results of the control done by the Institute of Nuclear Physics, Tirana on the radioactivity for the truck, showed that some parts in the motor of the truck were produced with radioactive contaminated material. After that event, extensive investigation was carried out in all the Albanian Skoda trucks. Out of 100 trucks controlled, three of them had radioactive contaminated related problems. During the dismantlement of the motors of the trucks, a gamma dose rate of 0.2-0.3 mSv/h at a distance of 1 metre was detected. The contaminated trucks were known to be produced during 1987-1990.

Last year, some Albanian private companies were engaged to gather and export scrap to Greece and Montenegro. The scrap was mainly produced from the dismantlement of the closed factories. Some of these factories were known to use the radioactive gauges. After two years of exports without any control, some of the companies have recently made a request to the Institute of Nuclear Physics to perform a radioactive control of scrap in order to obtain a certificate for export.

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## CONTAMINATION OF STEEL PRODUCED IN THE CR BY COBALT 60

(Prepared by I. Malátová, S. Foltánová and P. Rulík,  
National Radiation Protection Institute, Czech Republic)Summary

In recent years, the metal recycling industry has become aware of the presence of radioactive materials in scrap metal. While the problem has historical roots dating to the earliest days of the use of radium, the use of radioactive materials in industrial devices, coupled with incorrect disposal of those devices led to many cases where radioactive sources were unintentionally smelted in the course of recycling.

A survey was made of the steel contamination produced during the years 1993 to 1996 in nine steel producing plants. Altogether 721 steel samples were measured by semiconductor gamma spectrometry. In 62% of the samples, no cobalt 60 activity was detected, i.e. the activity was below the minimum significant activity. In 95.5% of the samples, activity concentration of cobalt 60 was below 10Bq/kg and in 3.4% of the samples, the activity concentration was between 100 and 1000 Bq/Kg. The samples were collected according to a scheme which ensured a random choice. In addition, eight samples collected in plants where the investigation was performed were measured, following the melting of contaminated scrap. These samples had activity concentration of cobalt 60 greater than 1000 Bq/kg.

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