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PROBLEMS WITH RADIOACTIVITY SCRAP
IN THE IRON AND STEEL INDUSTRY
OF THE CZECH AND SLOVAK REPUBLICS

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1. Introduction

This paper very briefly abstracts the actual experiences along with the problems of radioactive contaminated steel products. In relation to the program of the workshop, especially with contaminated scrap. With the annual amount of 6,5 mil. ton of steel production in Czech Republic is the consumption of the steel scrap about 3,2 mil. ton. The export of the steel scrap is about 1 mil. ton. In Slovak Republic is the whole consumption of the steel scrap about 1,5 mil. ton by the annual steel production between 3,5 -3,8 mil. ton. The volume between export and import of the scrap is approximately in balance. From the above stated consumption of the steel scrap, 40 % was delivered by external suppliers.

The great volume of the export is intended for west industrial markets and therefore the products must execute the ambitious standards for the quality of products. The Iron and Steel Plants has the certification for the management of the quality and some has also the certification for the environmental management according the Standards ISO 14000.

Since the year 1995 is more carefully examine the quality of the input raw materials, especially the steel scrap. The contamination of materials by radionuclides is the new parameter of the products quality. This deduction is conducted also by the experience of foreign producers and publication of many incidents due to melting some radionuclides. Some business partners demands the stipulation the maximum mass specific (Bq/g) of content the radionuclides, above all Co 60.

2. Valid legislative

In actual time is in Czech Rep. valid the Law No 22/97 -, „atomic act“ with additional regulations of the State Office for Nuclear Safety. Regulation No 184/1997 stated the clearance levels for radionuclides. From the radionuclides, which are soluble in the steel, is more important Co 60 - there the regulations gives the value of mass specific 0,3 Bq/g. **This value is inapplicable for the final steel products in business relations and therefore all producers in CR and SR optionally lower this value to 0,1 Bq/g (100 Bq/kg) (Valid for the final products and scrap as maximum value)**

3. Management of the problematic

Steel Federation Inc., which represents the most important steel producers in Czech and Slovak Republics, provide in the year 1994 the initiative motion for building up the **working team** for complex solution the

problems of radioactive contamination the scrap and steel products. The members of the working team are the experts of the main producers, on the side of consumers of the scrap and also experts from scrap suppliers firms. Beyond these experts are invited for cooperation the experts from State Office for Nuclear Safety, Ministry of Industry and Trade, Czech Metrological Institute - Inspectorate for Ionizing Radiation. For discussion are invited other institutions dealing with that problematic and are able to assist to resolution. For the working team and its results is very important, that the State authorities of the Czech Rep. has very good cooperation with the state authorities of the Slovak Rep. and so is secured the validity of all resolutions in both Republics. The representants of Steel Federation, as coordinators of the works in steel sector, are invited for cooperation with experts in special commissions of the State authorities. So is secured the mutual co-operation in the area: legislative - practice.

4. The design of the solution

Multistage framework for control the quality of the scrap is proposed.

It contains the following steps:

- I. Inspection of the imported scrap onto borders
- II. Inspection of the scrap in the scrap treatment plants -scrap suppliers
- III. Input inspection of the scrap in iron and steel plants
- IV. Inspection during the steel technology and inspection the final products
by producers.

From the mentioned framework is obvious, that without the close cooperation between inspection authorities, scrap suppliers and scrap consumers, the task of radioactive contamination cannot be successfully answered.

5. The achieved results

- a) The essential legislative was issued (see art. 2). The reminders of the iron and steel sector were accepted.
- b) The integral action in the case of detection the radioactivity in the scrap is prepared and is introduced into operation.
- c) The producers of detection and monitoring systems, presented in the Czech market had to pass out the type examine, executed by the Czech Metrological Institute.

d) The guide for visual detection of sources the radiation emission in the scrap were edited. In that guide are color photographs of 97 possible sources of radiation that can be possible found in the scrap. The origin of the radioactive sources are the orphaned sources from nuclear medicine, measuring instruments and equipment, transport containers, fire detectors and many other radioactive sources.

e) Instrumentations of all steel producers and scrap processing firms with monitoring systems for protection against contamination the steel technology by radionuclides.

Installation the devices for measurement the activity of radionuclides in steel and final steel products. The testimonial of mass specific in Bq/g is given to the clients in case of requirement.

f) Ministry of Industry and Trade draw out the experimental charge, upon whose framework would be worked out a proposal for „**system for control the movement the contaminated scrap**“. This system covers the following problems:

- assortment of contaminated scrap and detection the technology for its treatment (surface decontamination, directed melting, including deposition of ingots after melting in specialised firm, deposition without treatment)
- building up the system for the flow of information's between all places, where the contaminated scrap can be detected (producers, suppliers, borders).
- building up the central database for all necessary information's about the detection, treatment and the conditions for clearance .
- building up the complex legislative for provision the whole process, including proposal for changes of basic national acts, to quarantee the above described system.
- implementation of all works would be till the end of 1999.

6. Unfinished areas of the whole system for monitoring the contamination

The basic is the absence of monitoring the radioactive contamination of scrap and steel products on all borders points in both Republic. Hereafter is not finished tasks stated in article 5f the presented paper. There is the assumption, that this tasks will be fulfilled in course of the year 2000.

7. Suggestion for further action

For solving the whole problem was done the detailed analysis of the actual legislative in European countries, especially in determination the maximum allowed value for contamination of the scrap. There

was detected the great differences in this value and in some countries is in force additional detailed instruction, which adapted the limits for entrance to market. The same situation is with limits of radioactivity for final steel products.

Recommendations for future International cooperation

- unification the legislative for acceptable value of radioactive contamination the scrap and steel products in International business relations. Beyond existing clearing levels and other standards given by the valid acts in individual countries we recommend to determine and accept so called „**business limits**“, valid in commercial market. The „business limits“ will give the maximum acceptable value of radioactive contamination of the scrap and steel products. It would be also agreed and determined the form of its approve.

- subsequently build up the voluntary system for International business with using the „business limits“. In case that the value of contamination will be lower than the business limits, the scrap and steel products will be free for crossing the borders of that countries, which accept them.