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Group of Experts on Monitoring of Radioactively Contaminated Scrap Metal

**REPORT OF THE SECOND SESSION
(12-14 June 2006)**

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Executive summary

In 2002, the United Nations Economic Commission for Europe (UNECE) published a report on the “Improvement of the Management of Radiation Protection in the Recycling of Metal Scrap”. As a follow-up, a Group of Experts on Monitoring of Radioactively Contaminated Scrap Metal was convened under the auspices of the UNECE consisting of experts from Governments and concerned industry groups. The subject is of considerable importance considering that more than 50 percent of the metal used worldwide is recycled, and that much of it originates from a variety of sources and is combined by melting. In some cases the scrap metal may have been radioactively contaminated either through contact with natural materials such as soil or with artificial radionuclides from nuclear facilities or may inadvertently contain discarded radioactive sealed sources used in medicine, industry and agriculture. Typically, thousands of incidents are reported each year involving the detection of various types of radioactive substances in scrap metal. Undetected sources have been melted down accidentally or shredded with scrap metal, thereby entering the metal stream. While the potential health and safety risks of such incidents are usually not very high due to the relatively low radiation levels involved, they are still often above acceptable levels. The economic and financial consequences of such contaminated scrap metal and metal products for the recycling and metal industries are extremely high as it can frequently result in closure and clean-up of metal production facilities and in a possible loss of trust in the use of recycled metal.

The first session of the Group of Experts (Geneva, 5-7 April 2004) reviewed the results of a questionnaire that had been circulated to countries and discussed policies and experiences in monitoring and interception of radioactive scrap metal worldwide. The session focused on ways and means to facilitate and secure international trade and transport of scrap metal.

The second session of the Group of Experts (Geneva, 12-14 June 2006) was informed of country experiences and progress made since 2004. As its main task, the Group of Experts reviewed a comprehensive document containing Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal that are based on good practices, industry standards as well as national and international safety regulations and standards. The objective of these Recommendations is to assist Governments, the metal scrap and metal processing industries, demolishers, transport operators and temporary storage companies dealing with scrap metal to counter the occurrence of radioactive scrap metal by monitoring measures and to act jointly, responsibly and effectively in the event of radioactive material being found in scrap metal. The Recommendations provide a useful framework for action and cover areas of prevention, detection and response to incidents involving radioactive scrap metal. They cover any level of radioactivity in scrap metal that is above background levels where the radioactivity may be scrap metal that is activated, scrap metal that contains a sealed source, or scrap metal that is radioactively contaminated. The Recommendations should encourage further cooperation, coordination and harmonization in the fields of prevention, detection and response both at national and international levels.

Following a final review and agreement on the Recommendations by participating experts, the UNECE secretariat will publish and distribute the Recommendations in English, French and Russian.

Item 1 Attendance

1. The session was attended by experts from the following 26 countries: Belgium; Brazil; China; Croatia; Czech Republic; Estonia; Finland; France; Georgia; India; Indonesia; Ireland; Korea, Republic of; Malaysia; Morocco; Netherlands; Russian Federation; Slovakia; Slovenia; South Africa; Sweden; Switzerland; Tajikistan; Turkey; Ukraine; United States of America.
2. The European Community (EC), the International Atomic Energy Agency (IAEA) and the United Nations Institute for Training and Research (UNITAR) were represented.
3. The following non-governmental organizations participated: Bureau of International Recycling (BIR) and Eurometaux. Two representatives of metal scrap processing companies in the Netherlands and in Spain also participated at the invitation of the secretariat.

Item 2 Adoption of the agenda

Documentation: ECE/TRANS/AC.10/2006/1

4. The Group of Experts adopted the provisional agenda prepared by the secretariat without modification.

Item 3 Election of officers

5. The Group of Experts elected Mr. R. Turner (United States of America) as Chairman and Mr. E. Shakhpazov (Russian Federation) as Vice-Chairman of the session.

Item 4 Need for action

Documentation: ECE/TRANS/AC.10/2006/2; ECE/TRANS/AC.10/2006/3

6. The Group of Experts noted that the appearance of radioactively contaminated scrap is a growing problem. Following a serious incident with radioactive scrap metal in Spain in 1998, various Governmental authorities, the metal and recycling industries as well as labour unions agreed on a national collaborative approach on prevention, monitoring, response procedures and the sharing of costs in case of radioactive incidents. This so-called “Spanish Protocol” (ECE/TRANS/AC.10/2006/2) inspired the Group of Experts in 2004 and prompted their subsequent efforts.
7. In view of the high volume of internationally traded scrap metal and in order to avoid the introduction of discrete sources and improperly released radioactively contaminated material into the recycling stream, the UNECE together with the International Atomic Energy Agency (IAEA) and the European Commission (EC) produced in 2002 a “*Report on the Improvement of the Management of Radiation Protection in the Recycling of Metal Scrap*”. This report addressed in particular the economic and operational concerns of the scrap metal industry¹.

¹ See also: www.unece.org/trans/radiation/radiation.html.

8. In continuation of this work, the UNECE, with the support of the Government of the United States of America, prepared and circulated in 2003 a questionnaire to Governments and the industry with a view to gaining a broad understanding of and documenting the current legislation, knowledge and experience in the monitoring, interception and managing of incidents involving radioactivity in the scrap metal industry world-wide.

9. In April 2004 an international Group of Experts was convened under the auspices of the UNECE to discuss policies and experiences in monitoring and interception of radioactively contaminated scrap metal and to explore ways and means to facilitate international transport and trade of scrap metal. The proceedings of the meeting of the Expert Group together with extensive documentation on national experiences are contained in the UNECE report *“Monitoring, Interception and Managing Radioactively Contaminated Scrap Metal”*.²

10. The Group of Experts identified ten issues as a common basis for possible future work and recommended to keep in motion a permanent international dialogue on these issues among Governments and industries. As primary follow-on efforts the Group of Experts recommended to work on the following concrete outputs:

- (a) “Protocol”: Development of a voluntary international “Protocol” to increase the capture of scrap metal presenting signs of radioactivity, to reduce potential contamination and to aid in the disposition of found materials.
- (b) Information exchange: Establishment of an international web portal addressing radioactivity issues in the recycled scrap metal industry.
- (c) Training: Survey of current training opportunities and preparation of international training and capacity-building programmes covering the fields of action identified in the “Protocol” in order to assist the scrap metal sector.

11. Recalling these activities, the Group of Experts felt that use of the term “Protocol” at the international level as recommended under (a), even if applied in conjunction with the word “voluntary”, could lead to misinterpretation as to its nature, objective and scope. It was therefore agreed to use the following title for the preparation of such a document:

“Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal

Report of an International Group of Experts
convened under the auspices of the
United Nations Economic Commission for Europe
(UNECE)”

(hereafter referred to as “Recommendations” in this report).

² See also: www.unece.org/trans/radiation/pub.html.

Item 5 Objective and scope of the international recommendations

Documentation: ECE/TRANS/AC.10/2006/3

12. Inspired by the good experiences in Spain with the application of the Spanish Protocol, the UNECE, with the continued support of the Government of the United States of America analyzed information and experiences of 55 countries and on this basis prepared a document on the objectives and scope of the proposed international Recommendations document for consideration by the Group of Experts.

13. These Recommendations constitute the advice of an international Group of Experts and provide a comprehensive and consistent framework of recommendations, good practices, and model procedures and examples. The objective of the Recommendations is to facilitate commerce by minimizing the likelihood of the occurrence of radioactive scrap metal by prevention and detection and to facilitate the safe management of any radioactive scrap metal that is discovered.

14. The Recommendations are based on and are consistent with existing national and international regulations, codes of conduct, standards and practices related to assuring safety in the management of radioactive materials. Their use should assist Governments and the industry to develop and/or improve their own systems of prevention, detection and response procedures for radioactive scrap metal.

15. The Recommendations address a large number of multi-sectoral issues and should contribute to developing and maintaining an effective partnership between all parties concerned with radioactive scrap metal, mainly the demolition, metal scrap recycling and metal industries as well as Ministries and Governmental authorities in the fields of nuclear safety, radiation protection, energy, transport, Customs, commerce and the environment. They address all stages of the recycling process, including demolition, procurement, transport, storage and melting.

16. The Recommendations do not establish legal commitments nor do they oblige countries or industry groups to transpose its provisions into national practice, codes of conduct, formal guidance documents, administrative regulations or law. Rather, they provide a helpful framework to assist relevant parties to improve, where necessary, their actions with respect to the collection, trade, transport, melting, or processing of scrap metal. The application of the Recommendations in a country will always depend on the requirements of national laws and regulations.

Item 6 Overview of key issues

Documentation: ECE/TRANS/AC.10/2006/4/Rev.1; ECE/TRANS/AC.10/2006/4/Add.1/Rev.1

17. In preparing for this meeting, the UNECE secretariat transmitted a questionnaire to participating countries with a view to updating the results obtained in 2004 and to obtaining a sound basis for the preparation of recommendations in this field. The assessment, based on replies from nearly 50 countries, focused on the following fields of action: Prevention,

Detection and Response. It served to highlight existing best practices and areas requiring further attention.

18. In the field of prevention the information provided showed that a large number of countries have a relevant regulatory framework, including active enforcement, penalties for non-compliance, and established exemption levels all relevant to the problem of radioactive scrap metal. In general there have been positive changes in all of these areas in the period from 2004 to 2006. In addition, there has been a significant increase in the number of countries that are using the IAEA Code of Conduct for the Safety and Security of Radioactive Sources. Areas requiring further attention were identified to include the need to:

- (a) systematically collect and analyze data on radiation levels from radioactive scrap metal and processed metal shipments;
- (b) increase efforts to establish appropriate regulatory mechanisms for controlling NORM (Naturally Occurring Radioactive Material) and TENORM (Technologically-Enhanced Naturally Occurring Radioactive Material);
- (c) establish guidelines for identifying and characterizing sources at metal processing facilities;
- (d) more effectively monitor imported and/or exported scrap metals for radioactivity;
- (e) ensure that contracts include provisions that scrap metal shipments are monitored for radiation; and
- (f) more effectively train personnel at processing facilities; and (g) standardize approaches to defining the location in the processing chain where ownership of scrap metal is transferred from seller to buyer.

19. In the field of detection, it was difficult to obtain clear trends from the answers to the questionnaires. However, areas requiring attention could be identified as follows and included the need for:

- (a) countries to issue detailed technical directives and guidance providing instructions on the proper application of detection systems;
- (b) establishing a consistent and fully comprehensive approach to monitoring for radiation in imported and exported scrap metal shipments at border crossings and at points of departure and arrival;
- (c) making monitoring comprehensive and mandatory;
- (d) having monitoring occur at the beginning of the distribution chain while still retaining monitoring further down the chain;

- (e) issuing appropriate regulations and guidelines for radiation monitoring in scrap yards and metal processing facilities;
- (f) establishing a standard approach for the acquisition, quality assurance, maintenance, calibration, and use of radiation detectors at monitoring locations; and
- (g) possible consistent, worldwide-accepted detection alarm threshold settings.

20. In the field of response, the information provided showed that most countries require government investigation of all detection/alarm reports, have established protocols defining response actions in the event of a detection alarm, have established clear responsibilities for financial and physical disposition of detected radioactive materials and have specific and detailed processes, regulations or guidance to facilities for disposition of detected sources. Most countries indicated that, when the radioactive source or material is known, they can readily transport it in compliance with established transport regulations. Areas requiring attention included the need for:

- (a) developing appropriate forms to guide the reporting and response actions of those involved in detecting and acting upon detections of radioactivity in metals;
- (b) developing information brochures, bulletins and posters summarizing steps to be taken in response to an alarm indicating radioactivity in metals;
- (c) establishing a formal procedure for defining the reporting process and associated actions for a radiation alarm;
- (d) establishing a consistent and comprehensive basis for response to alarms, both by governmental agencies and by the scrap metal industry;
- (e) including in recovery programmes the regulatory method that allows for transporting radioactive material or sources where the radioactive contents are undefined;
- (f) establishing an international standard that allows processing facilities to melt contaminated metal, and to accumulate detected materials on their sites, especially if below internationally accepted clearance levels; and
- (g) establishing a free-of-charge disposal facility or a return-to-sender policy to facilitate resolution of incidents involving radioactive scrap and metal products.

21. In addition to these country replies, the Group of Experts also heard during the meeting detailed reports on specific recent experiences obtained in selected countries and of the difficulties encountered in monitoring and response procedures for radioactive scrap metal.

22. The Group of Experts noted that all of these findings have guided and were the basis for the development of the draft Recommendations.

Item 7 Recommendations on monitoring and response procedures for radioactive scrap metal

Documentation: ECE/TRANS/AC.10/2006/5; ECE/TRANS/AC.10/2006/5/Add.1

23. The Group of Experts considered in detail the draft Recommendations prepared by the UNECE secretariat in cooperation with country experts as contained in document ECE/TRANS/AC.10/2006/5 and ECE/TRANS/AC.10/2006/5/Add.1. It accepted the general layout and structure of the Recommendations and the models contained in its annexes focusing on prevention, detection and response procedures in case of occurrence of radioactive scrap metal.

24. The Group of Experts considered in detail the provisions and models contained in the document prepared by the UNECE secretariat and decided on numerous modifications to clarify the text and to align its provisions with the agreed upon nature, objective and scope of the Recommendations.

25. Critical issues of definition and scope were discussed and the following was agreed:

Definitions:

It was agreed to refer, to the extent possible, to definitions set forth by the IAEA in its Basic Safety Standards (BBS) and Safety Glossary and to ensure consistency with the terminology used therein as these are used internationally. Particular care would need to be given to define, in line with the scope of the Recommendations, the terms “radioactive material”, “radioactive substance” and “radioactive scrap metal”, or alternatives thereto with a view to addressing: (a) different types of radioactive scrap metal (i.e. radioactively contaminated scrap metal, activated scrap metal and scrap metal with a radioactive source or material contained within it) and (b) materials considered to be within regulatory control and materials which are outside regulatory control.

Objective and Scope:

It was agreed that the Recommendations cover scrap metal that is activated, scrap metal that contains a sealed source, and scrap metal that is radioactively contaminated. It was noted that the Recommendations would apply to both materials normally under nuclear regulatory control and materials outside nuclear regulatory control. The Recommendations focus more specifically on detection and response than on prevention since these are the areas requiring more attention in the context of radioactive scrap metal. Also, the Group of Experts noted that the emphasis in these Recommendations is on trade and commerce rather than on security and illicit trafficking. The Recommendations describe procedures and mechanisms for the different parties involved (e.g.: transport sector, customs, scrap yards managers, etc.) to take effective action in their own particular circumstances involving radioactive scrap metal.

26. With regard to the technical annexes to the Recommendations, it was agreed that while the body of the Recommendations provides a framework for action, the annexes would offer

illustrative examples of existing best practices. Experts were invited to transmit further examples to the UNECE secretariat to be included in these annexes.

27. Based on the general views expressed and subject to the detailed modifications made by the Group of Experts during the meeting, the UNECE secretariat was requested to prepare a revised version of the Recommendations and its annexes taking account of the modifications agreed upon and the suggestions made during the session. These revised Recommendations will be circulated to all participating experts in July 2006 to ensure that the modifications agreed upon during the meeting are suitably reflected in the revised text.

28. Following this review and assuming that agreement is reached on the Recommendations by the experts participating in the June 2006 meeting, the UNECE secretariat will publish and distribute the Recommendations in English, French and Russian.

Item 8 Other relevant issues and next steps

Documentation: ECE/TRANS/AC.10/2006/6

29. On the basis of a document prepared by the UNECE secretariat, the Group of Experts considered briefly possible follow-up work to be undertaken once the Recommendations have been finalized.

30. It was noted that it was important that the Recommendations are widely circulated, particularly to all stakeholders regulating and/or contributing to the metal recycling stream. The general need for training, capacity building and information exchange between all parties involved was stressed, including the need for technical assistance to countries not having the required experience, expertise and sophisticated technical instruments to monitor and respond adequately to radioactive scrap metal. In addition, efforts would need to be made to identify and, if required, to develop user-friendly training material to ensure that targeted personnel were capable of using the Recommendations as an effective tool to prevent, detect and respond to radiation incidents related to scrap metal without jeopardizing commerce and safety.

31. Thus, future efforts should focus on these areas of work to be undertaken jointly by competent governmental and industry bodies.

32. In this context, the experts from the United States of America made available CD-ROMs of training modules developed in the USA on “Responding to Radiation Alarms” and on “Identifying Radioactive Sources at the Demolition Site”.

33. Also, the Group of Experts was informed by representatives from the United Nations Institute on Training and Research (UNITAR) of their global training programmes, capabilities and networks of specialized bodies and from the European Commission about current work on a platform of training modules addressed to competent authorities and training centres in the 25 countries of the European Union.

34. The Group of Experts also noted that the Recommendations would need to be reviewed from time to time by Governmental and industry experts that were experienced and competent in

prevention, detection and response procedures at national and international levels, in order to reflect the state-of-the-art expertise in dealing with radioactive material in scrap metal. Therefore, consideration could be given to re-convening the Group of Experts at regular intervals, possibly starting in 2008, with a view to monitoring progress made by Governments and industries in dealing efficiently with the issue of radioactive scrap metal.

Item 9 Closing session

35. The chairman of the Group of Experts invited the UNECE secretariat to prepare a short report of the meeting that could be quickly made available to all participating experts. In addition to the Recommendations, the report of the meeting will be published by the UNECE secretariat later this year in English, French and Russian.

36. All documents as well as the presentations made during the Expert Group meeting will be available at the relevant UNECE website (www.unece.org/trans/radiation/radiation.html).

37. Finally, the chairman expressed his appreciation to all participating experts from United Nations member countries, international organizations, the industry and the UNECE secretariat and noted that they had contributed in a very professional and constructive manner to the successful conclusion of the meeting. He stressed that the Recommendations prepared by the Group of Experts would be an important step forward for all Government departments and industries involved in the scrap metal sector and expressed the hope that the Recommendations would be widely used to deal effectively with radioactive scrap metal.
