

United Nations
Economic Commission
for Europe

United Nations
Institute for
Training and Research

**International Training and
Capacity Building Strategy
for Monitoring and
Response Procedures
for Radioactive Scrap Metal**



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ACRONYMS and DEFINITIONS

Definitions (see “*Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal*” for more)

- (a) **Naturally Occurring Radioactive Material (NORM):** Material containing naturally occurring radionuclides.
- (b) **Orphan source:** A radioactive source which is not under regulatory control, either because it has never been under regulatory control, or because it has been abandoned, lost, misplaced, stolen or otherwise transferred without proper authorization.
- (c) **Polluter Pays Principle:** The principle that the polluter (*i.e., owner of the source or radioactive material*) should bear the cost of pollution (*i.e., recovery, radioactive waste management and clean-up*), with due regard to the public interest and without distorting international trade and investment.
- (d) **Radiation protection:** The protection of people from the effects of exposure to ionizing radiation, and the means for achieving this.
- (e) **Radiation protection experts:** Persons who have been approved by national authorities as certified experts having had appropriate training and experience in operational radiation protection.
- (f) **Radioactive material:** Material designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.
- (g) **Radioactive scrap metal:** This may comprise radioactively contaminated scrap metal, activated scrap metal and scrap metal with radioactive source(s) or substances contained within it. It may include both radioactive substances that are subject to regulatory control and radioactive substances that are outside regulatory control.
- (h) **Radioactive substance:** A substance which exhibits radioactivity.
- (i) **Radioactivity:** The phenomenon whereby atoms undergo spontaneous random disintegration, usually accompanied by the emission of radiation.
- (j) **Regulatory body:** An authority or a system of authorities designated by the Government of a State as having legal authority for conducting the regulatory process, including issuing authorizations, and thereby regulating nuclear, radiation, radioactive waste and transport safety.
- (k) **Response level:** A radiation level above which outside radiation protection experts should be involved.

Note: In this document the term ‘radioactive material’ as defined above, is used to denote material that is radioactive by regulatory definition. The term ‘radioactive substance’ is used to describe material that is radioactive in the physical sense and so it may be within regulatory control or outside of regulatory control. Similarly, the term ‘radioactive scrap metal’, as defined above, may include radioactive substances that are within regulatory control and radioactive substances that are outside regulatory control.

ACRONYMS

BIR	–	Bureau of International Recycling
IAEA	–	Atomic Energy Agency
QA	–	Quality assurance
TOR	–	Terms of reference
UNECE	–	United Nations Economic Commission for Europe
UNITAR	–	United Nations Institute for Training and Research
WCO	–	World Customs Organization

I. SETTING THE SCENE

A. Introduction

In 2004, the worldwide consumption of scrap metal was of the order of 440 million tonnes with around 184 million tonnes traded internationally.¹ The proportion of steel products now made from scrap is more than one half. With metal scraps coming from many different sources, both international and national, then melted together, the risk of radioactive contamination entering the recycled metal stream, from both artificial and natural sources, increases.

Radioactivity can become associated with scrap metal in many different ways: radioactively contaminated scrap metal, activated scrap metal and scrap metal with radioactive source(s) or substances contained within it. To cover all three cases, the UNECE Group of Experts on the topic has chosen to use the term “**radioactive scrap metal**”. It may include both material that is subject to regulatory control and material that is outside regulatory control.

While the problem of radioactive scrap metal is set to grow, capacity to deal with radioactive scrap metal per se is still limited. A number of initiatives, notably by the International Atomic Energy Agency (IAEA), the World Customs Organization (WCO),² the UNECE^{3,4} or Spain,⁵ have been undertaken, but to date, there has been little published work at the international level aimed specifically at countering the problem of radioactive scrap metal although guidance is currently being developed by the IAEA and the EU.

Results from an initial survey of training in this field undertaken by UNECE over the summer of 2006, indicate, notably that:

- There is a big disparity between countries in the type of training, the intensity of training, the target audience etc. which appears to reflect very different understandings of the issue and the level of risk.
- Limited training material exists, but its transferability from one country to another is hampered by language and suitability to different contexts.
- Most of the training emphasis to date appears to be on detection.

Efforts at building capacity tend to address “radiation protection” in general terms despite the fact that issues relevant to the scrap metal sector deserve particular priority and are very specific. Some of the main reasons for this are the large amounts that are being recycled and traded internationally and the particular shielding properties of metal which makes it more difficult to detect radioactive sources. In addition, the scrap metal recycling stream passes through numerous actors, both public and private, and for this reason it adds to the complexity of managing the issue. Importantly, given that no one wants metal that exhibits any level of detectable radioactivity, the issue of radioactive scrap metal concerns both material that is within and outside regulatory control. Some of the capacity building issues that need to be addressed include a better understanding of how scrap metal can become contaminated, what to watch out for when collecting scrap metal, what are risky sources of scrap metal etc. Given the significant proportions of scrap metal traded internationally, the disparity between countries’ capacities to deal with radioactive scrap metal also increases the risks of radioactivity appearing in scrap metal.

¹ Bureau of International Recycling (BIR).

² International Atomic Energy Agency, Detection of Radioactive Material at Borders, jointly sponsored by IAEA, WCO, EUROPOL, and INTERPOL, IAEA-TECDOC-1312, IAEA, Vienna, (2002).

³ United Nations Economic Commission for Europe, Report on the Improvement of the Management of Radiation Protection Aspects in the Recycling of Metal Scrap, co-sponsored by the International Atomic Energy Agency and the European Commission, UNECE, Geneva, (2002).

⁴ United Nations Economic Commission for Europe, Monitoring, Interception and Managing Radioactively Contaminated Scrap Metal, Proceedings of the UNECE Group of Experts Meeting, UNECE, Geneva, 5-7 April 2004.

⁵ MINER, The Ministry of Development, CSN, ENRESA, UNESID, FER, Spanish Protocol for Collaboration on the Radiation Monitoring of Metallic Materials, Madrid, (2005 version).

This training and capacity building strategy developed jointly by UNECE and UNITAR takes as its starting point the UNECE Group of Experts “Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal”. It identifies the main areas for which increased capacity may be required and offers options for addressing these gaps. It also aims to help governments, potential donors and the private sector to identify training and capacity building needs in order to enhance their ability to prevent, detect and respond to radioactive scrap metal, thereby reducing the risks involved.

B. Introducing the UNECE Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal

The UNECE has been engaging on the issue of radioactive scrap metal since 2001, when it published a report on the “Improvement of the Management of Radiation Protection Aspects in the Recycling of Metal Scrap”⁶ which provides an overview of the processes that could lead to the introduction of radioactive substances into scrap metal and recommends measures to avoid their introduction into the metal recycling stream. In continuation of this work, in April 2004 the UNECE convened the first meeting of an international Expert Group to document the current knowledge and experiences on monitoring, intercepting and managing radioactive scrap metal and to recommend future actions. At this meeting, the Group of Experts felt that three follow-up actions needed to be taken, one of which was the development of international recommendations. This was followed through at a Second Expert Group meeting which was held in June 2006 at which the “Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal” were approved. These Recommendations are important as they provide guidance to the different sectors and actors involved, including: Customs’ officers, transport companies, scrap yards, the metal industry, regulatory agencies etc.

While work has been undertaken by the International Atomic Energy Agency (IAEA), the European Commission (EC), Spain and others, so far there exist no international standards and specific practical measures to monitor, intercept and manage radioactive scrap metal even though large amounts of recycled metal are traded internationally. More specifically, there are as yet no accepted norms or guidance that cut across the different sectors that are involved in the trade in scrap metal which may potentially exhibit radioactivity. The recommendations drawn up by the UNECE in collaboration with international experts intend to begin to bridge this gap. Their objective is to establish a framework that provides, within existing national and international safety standards, guidance on areas to be addressed and mechanisms to be set up in order to effectively monitor, intercept and manage radioactive scrap metal.

It is expected that the use and dissemination of these Recommendations will enable a better long-term management of radioactive scrap metal globally.

II. THE STRATEGY

A. Aims of the strategy:

The overall **goal** of the training/capacity building strategy is to support governments and the scrap metal industry at large, as well as other relevant stakeholders, in the implementation of the “Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal”. While very specific and specialized training exists (see “survey” below), this strategy is intended to provide a comprehensive overview of the different elements that should be in place both nationally and internationally to ensure sufficient capacity exists to deal effectively with radioactive scrap metal, as well as outlining possible activities that may address gaps.

⁶ Available on: <http://www.unece.org/trans/radiation/pub.html>.

B. Use of the strategy

The strategy is intended to support governments, the private sector, and others to determine gaps in capacity and to identify options for supporting the scrap metal sector in its attempts to better control and manage the risk of radioactivity in scrap metal. It contains an overview of the key issues, identifies the audiences for training, highlights the types of training available and those that may need to be developed as well as the approaches and tools.

C. Audiences

The main audiences for training and capacity building will be the key actors in the metal recovery sector. These can be sub-divided as:

Government

- Regulatory agencies
- Customs authorities
- Agencies/departments responsible for safe transport of dangerous goods
- Environment agencies and ministries
- Health agencies and ministries

Nuclear installations

- Research facilities manufacturing sealed radioactive sources
- Nuclear industry facilities manufacturing sealed radioactive sources

Metal Industry

- Scrap yard managers and staff
- Processing plants managers and staff
- Smelting plants managers and staff

Transport industry

- Transporters/carriers
- Port authorities
- Railway authorities
- Relevant airport authorities

Certification industry

- Independent certifiers

Associations/federations of:

- Metal producers
- Recyclers
- Scrap dealers

Academia

- Training institutions
- Continuing education centres
- Universities
- Specialized training centres
- Radiation protection experts

D. Lessons learnt from other relevant capacity building strategies

The World Customs Organisation (WCO) in its capacity building strategy⁷ identified 6 lessons learned from previous capacity building activities that are useful to note here.

1. The need for accurate diagnosis of capacity building needs and the development of country-specific responses

Experience suggests that one of the critical success factors associated with the conduct of effective capacity building initiatives is the accurate diagnosis of developmental needs.

2. The need for sustained high-level political will and commitment

High-level political will and commitment is important to the successful conduct of capacity building programmes. Without such commitment, maintained over the longer term, capacity building efforts are likely to be unsuccessful, regardless of the quality of their design and implementation.

3. The need for enhanced co-operation and coherence

One of the perennial problems facing all capacity building recipients and providers is the poor level of co-ordination and communication between national, regional and international donors leading to duplication of effort in certain areas and little or no attention to others.

4. The need for greater ownership and participation

Many capacity building programmes have failed to adequately address the need to obtain the full participation and commitment of key actors. As a result, they have had little personal stake in, or commitment to, the activities being promoted through various capacity-building activities. Such participation needs to be obtained well before the implementation of any capacity building programmes.

5. The need for realistic government and donor expectations

In reviewing many capacity building projects and other activities that have been conducted during the past decade, the WCO identified few that met or exceeded their stated developmental objectives. It is likely that many initiatives were evaluated against somewhat unrealistic and overly ambitious expectations. Moreover, in many cases the capacity building inputs were either inappropriate or insufficient to ensure the transformations expected.

6. The need for adequate human and financial resources to be devoted to capacity building initiatives

Many capacity building projects deliberately limit the number and duration of short and long-term advisors assigned to particular projects. In order to redress these problems, capacity building initiatives should:

- incorporate significantly longer implementation time-frames;
- make better provision for post-implementation support;
- incorporate adequate provision for short and long term in-country advisors; and
- include mechanisms for the provision of additional support and long-term funding provisions (particularly in the case of communication and information technology based interventions).

These lessons are useful to consider when developing and implementing this strategy.

⁷ WCO, 2002. Customs Capacity Building Strategy, Prepared by the World Customs Organization on behalf of the international Customs community (http://www.wcoomd.org/ie/En/Topics_Issues/topics_issues.html).

III. THE UNECE RECOMMENDATIONS ON MONITORING AND RESPONSE PROCEDURES FOR RADIOACTIVE SCRAP METAL

A. Objectives and Scope of the UNECE Recommendations

The “Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal” (“Recommendations” hereafter) are intended to support States in developing their own national systems of monitoring and response related to radioactive scrap metal and to encourage further cooperation, coordination and harmonization at the international level, thereby creating global confidence in the reliability, effectiveness and quality of monitoring and response. In doing so they aim to facilitate national and international trade in scrap metal. Ultimately they serve to protect human health and the environment from any risks involved with the radioactivity potential of scrap metal.

They are intended to assist governments (customs or border authorities, and the Governmental bodies responsible for safety, health and the environment), industry (demolition companies, scrap collectors, sellers of scrap metal, owners of scrap yards, owners of scrap metal processing facilities, buyers and traders in scrap metals, temporary storage companies, owners of metal works, the transporters of scrap metal,) and all concerned parties to counter the problem of radioactively contaminated scrap metal, activated scrap metal and scrap metal with radioactive source(s) or substances contained within it (termed ‘radioactive scrap metal’ in this document) by seeking to prevent its occurrence, by effectively monitoring metal shipments and facilities, and by intercepting and managing any radioactive scrap metal that is detected. The Recommendations cover all metals used and traded nationally and internationally as part of the metal recycling industry.

Finally, the Recommendations are not intended to place legal commitments on countries but, instead, to provide recommendations and examples of good practice which have been agreed upon by governmental and industry experts in the field for application on a voluntary basis.

B. Fields of Action

The core of the Recommendations is divided into three main steps, or fields of action: **prevention, detection and response**. Each of these fields of action contains groupings of specific recommendations addressed at different actors in the scrap metal industry. An analysis of each field of action in the Recommendations allows us to identify the specific actors targeted for each individual group of recommendations (see table 1 - also see Annex I for a full list of the Recommendations).

Prevention – Recommendations related to **prevention** essentially address State authorities. These include: regulatory authorities, radiation protection agencies, law enforcement agencies, emergency services, radioactive waste transport and disposal agencies.

Detection - Recommendations related to **detection** are essentially addressed at Customs’ authorities and the private sector. The latter may include managers/owners of scrap yards, processing facilities, melting plants and also certifiers.

Response - Recommendations related to **response** cover essentially the same private sector actors as highlighted under detection, but also State regulatory authorities, Customs and the authority responsible for the safe transport of hazardous waste.

Finally a number of additional recommendations appear at the end of the document and refer to issues such as reporting, coordination, financing and training. These are targeted at all the actors involved in the scrap metal industry, from both private and public sectors.

Table 1: Overview of target audience for each field of action

	Prevention	Detection	Response
Public sector	√	√	√
Private sector		√	√

IV. EXISTING MATERIAL AND GAPS

A. Description of survey undertaken

The UNECE undertook a survey in summer 2006 among 56 countries, as well as a number of agencies and representatives of the private sector, to identify existing training and capacity building opportunities in the area of managing radioactive scrap metal. The aim was to determine what already exists in terms of training and capacity building efforts in this field and to define gaps. Twenty countries responded to the survey, as well as the IAEA, the Bureau of International Recycling (BIR), and a consultant for the scrap metal sector. A number of preliminary general conclusions can be drawn from this survey.

B. Findings of survey

Based on the survey, a number of conclusions were made at the national and international levels.

At a national level:

Firstly, it would appear that while most countries have some sort of national training, there is limited regional or sub-regional training and exchange. Training tends to be conducted nearly exclusively at a national level. A second conclusion is that the focus of training suggests that there is an emphasis on dealing with radiological emergency response that requires the immediate intervention of state authorities. Limited effort seems directed at dealing with what appear to be smaller incidents, despite the fact that these may hide potentially serious problems. Thirdly, in many cases, training courses tend to address multiple audiences and are, therefore, relatively general in nature. Very few respondents noted that they had specific courses for the scrap metal sector for instance. As this sector is the main target for the Recommendations developed by the UNECE Group of Experts, this is an important point. In addition, in many countries this sector may be quite informal and it may require additional effort to effectively reach target audiences. A fourth conclusion is that there appears to be an over-dependence on training in the use of monitoring devices rather than in the entire prevention, detection and response process.

At an international level:

The IAEA offers the opportunity for tailor-made training at regional and national levels. To date audiences targeted by the IAEA have tended to be professionals or experts essentially from the regulatory bodies or Customs.

The survey provided an indication of where current efforts are being focussed in terms of monitoring and response to radioactive scrap metal. Table 2 shows an overview of the fields covered by training by the respondents to the survey.

Table 2: Overview of fields covered by training (based on the UNECE survey)

Country	Fields covered		
	Prevention	Detection	Response
Belgium	√	√	√
Brazil		√	√
Croatia		√	
Czech Republic		√	√
Estonia	√	√	√
Estonia (private sector)	√	√	√
India	√	√	√
Ireland		√	
Italy	√	√	
Latvia	√	√	√
Lithuania	√	√	√
Luxembourg		√	√
Norway		√	√
Romania		√	√
Russian Federation	√	√	√
Slovenia	√	√	√
Spain	√	√	√
Sweden	√		
Switzerland	√	√	√
Tajikistan	√	√	
USA	√	√	√
IAEA	√	√	√
BIR		√	√
Consultant (scrap metal industry)		√	

The above table gives us an indication of where most of the effort is currently being placed in training and capacity building. Nonetheless, at this stage it should be seen as just a first overview of a selection of countries and not an exhaustive analysis.

V. PRIORITIES AND ACTIONS

The Recommendations serve to provide a checklist of elements that countries need to have in place in order to address the problem of radioactive scrap metal. The next section (section A) uses this checklist to determine what capacities individual actors need to have in place. It is intended to support countries with existing capacity to determine where they may have gaps and where they may need to invest in their training and capacity building. Section B is intended for countries with limited or no capacity in place who will require a more comprehensive process to assess their specific needs.

A. Required capacities

Individual guidance contained in the Recommendations helps to establish the required capacities of key actors to deal with radioactive scrap metal.

Below we identify for each individual specific recommendation the sort of capacities that will be required by different actors. Each table refers to a different actor or group of actors.

Such an analysis allows us to determine for each field of action what are minimum capacity needs for key actors in the scrap metal industry.

1. Prevention

Table 3: Recommendations on Prevention for STATES⁸

<u>Recommendations on Prevention for States</u>	<u>Expected capacity</u>
States should:	
P-PO1: have in place an effective national legislative and regulatory system of control, over sealed radioactive sources and radioactive material	Trainees should be able to develop and update policies and regulations covering, notably:
P-PO2: have appropriate facilities, arrangements and services for radiation protection available to persons who are authorized to manage radioactive sources	<ul style="list-style-type: none"> - safety of workers - management and disposal of radioactive waste - decontamination - regional and international cooperation and information sharing
P-PO3: ensure that adequate arrangements are in place for the training of staff from the regulatory body, law enforcement agencies and emergency service organizations	<ul style="list-style-type: none"> - transportation of radioactive scrap metal - information on keeping sources safe
P-PO4: establish a national register of radioactive sources	Trainees should be able to define the necessary infrastructure to deal with radioactive scrap metal. This includes:
P-PO5: ensure that source owners carry out regular checks to confirm that their inventory of radioactive sources is intact	<ul style="list-style-type: none"> - establishing terms of reference (TORs) for radiation protection body that include scrap metal - establishing, updating and managing national registers of sources - facilities to deal with radioactive scrap metal
P-PO8: ensure that the possession, remanufacturing or disposal of disused sealed radioactive sources takes place in a safe manner	
P-PO9: provide arrangements for the safe management and disposal of radioactive waste	Trainees should be able to develop procedures to deal with disused sealed sources
P-P2: review and, if necessary, improve national arrangements to counteract the possible presence of radioactive scrap metal	Trainees should be able to develop necessary procedures and checks to deal with radioactive scrap metal
P-P3: require Custom to install radiation monitors for scrap metal shipments at key border points and encourage owners of major scrap metal yards, processing facilities and melting plants to install similar equipment for incoming and outgoing shipments	Trainees should be able to provide advice on monitoring equipment (also, on minimum requirements)
P-PO6: promote awareness of the safety and security hazards associated with orphan sources	Trainees should be able to:
P-PO7: emphasize to sealed radioactive source designers, manufacturers, suppliers and users and those managing disused sources their responsibilities for the safety and security of the sources	<ul style="list-style-type: none"> - understand security concerns with respect to sealed radioactive sources and orphan sources - provide advice on dealing with orphan sources and sealed radioactive sources
P-P1: assess the likelihood of the occurrence of events involving the presence of radioactive scrap metal within the State	Trainees should be able to assess: <ul style="list-style-type: none"> - the extent of scrap metal trade in the country, the origin and type of scrap metal, the nodal points in the scrap metal trade network. - health risks - environmental risks - the presence of potentially radioactive scrap metal

⁸ Please note that recommendations are paraphrased. For detailed recommendations, see Annex I.

2. Detection

Table 4: Recommendations on Detection for: STATES

<u>Recommendations on Detection for States</u>	<u>Expected capacity</u>
States should:	
<p>D-G1: ensure that monitoring is carried out at each of the key points of scrap metal movement within the State. The monitoring should take the form of:</p> <ul style="list-style-type: none"> • administrative monitoring • visual monitoring • radiation monitoring 	Trainees should be able to set up an effective radiation monitoring system in the State and at its borders that covers the scrap metal recycling chain
<p>D-G2: exchange information on monitoring and response arrangement with neighbouring States</p>	Trainees should be equipped and encouraged to share relevant information and to cooperate with other States.

Table 5: Recommendations on Detection for: PERSONS RESPONSIBLE FOR MONITORING

<u>Recommendations on Detection for Persons responsible for the reception and monitoring of the shipments</u>	<u>Expected capacity</u>
Persons responsible for the reception and monitoring of the shipments should:	
<p>D-AM1: be alerted if the shipment:</p> <ul style="list-style-type: none"> • arrives without evidence of radiation monitoring having been performed before or during shipment • Is from a supplier with a previous history involving the supply of radioactive scrap metal; or • is not known to the company or the regulatory authorities 	<p>Trainees should be able to</p> <ul style="list-style-type: none"> - develop a system (e.g. register, database,...) to keep records of their suppliers - correctly interpret certificates of radioactivity monitoring

Table 6: Recommendations on Detection for: CUSTOMS

<u>Recommendations on Detection for Customs</u>	<u>Expected capacity</u>
Customs or border authorities should:	
<p>D-RMB1: ensure that shipments of metal scrap are checked by administrative and visual means</p>	<p>Trainees should be able to:</p> <ul style="list-style-type: none"> - visually recognize radioactivity warning signs, sources and their housings - make a risk analysis of different sources of scrap metal

D-RMB2: perform radiation monitoring at each major road and rail border crossing on shipments of scrap metal	<p>Trainees at <u>decision-making levels</u> should be able to:</p> <ul style="list-style-type: none"> - know where to place monitors - know which type of monitor applies best to their given situation <p>Trainees responsible for <u>on the ground</u> control should be able to:</p> <ul style="list-style-type: none"> - use monitors - interpret results
D-RMB5: provide appropriate training in radiation monitoring and initial response procedures for those likely to be involved in the monitoring of scrap metal shipments	
D-RMB3: ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures	<p>Trainees should be able to:</p> <ul style="list-style-type: none"> - develop quality assurance (QA) procedures for the good working of the detection systems <p>They may also have the ability to:</p> <ul style="list-style-type: none"> - test monitors and - calibrate monitors <p>(although this can be done by external radiation protection experts or by the providers of the detectors)</p>
D-RMB4: arrange for calibration and testing of the detectors at least annually	
D-RMB6: establish a response plan for action in the event of radioactive material being discovered	<p>Trainees should know what are the steps to take once an alarm is triggered, including:</p> <ul style="list-style-type: none"> - carrying out preliminary investigations based on monitoring results - taking appropriate actions based on monitoring results - reporting quickly and efficiently to the relevant authority.
D-RMB7: make a formal arrangement with a national organization with expertise in radiation monitoring and radiation protection: <ul style="list-style-type: none"> • to provide training on radiation detection and response procedures, and • to provide assistance in the event of radiation incidents 	

Table 7: Recommendations on Detection for: PERSONNEL AT SCRAP YARDS, PROCESSING AND MELTING FACILITIES

<u>Recommendations on Detection for personnel at scrap yards, processing facility and melting plant</u>	<u>Expected capacity</u>
Personnel at scrap yards, processing facility and melting plant should:	
D-VM1: be trained to visually recognize radioactivity warning signs and the different types of radiation sources and source housings	<p>Trainees should be able to:</p> <ul style="list-style-type: none"> - visually recognize radioactivity warning signs, sources and their housings

Table 8: Recommendations on Detection for: OWNERS OF COMPANIES FROM WHICH SCRAP METAL SHIPMENTS ORIGINATE

<u>Recommendations on Detection for owners of companies from which scrap metal shipments originate</u>	<u>Expected capacity</u>
Owners of companies from which scrap metal shipments originate should:	
D-RMO1: ensure shipments are checked by administrative and visual means for the possible presence of radioactive scrap metal	<p>Trainees from the companies that are responsible for <u>day to day operations</u> should be able to:</p> <ul style="list-style-type: none"> - visually recognize radioactivity warning signs, sources and their housings <p>Trainees from the companies that are at <u>decision-making levels</u> should be able to</p> <ul style="list-style-type: none"> - make a risk analysis of different origins of scrap metal
<p>D-RMO2: perform monitoring of shipments for radiation at the exit of the premises where scrap is collected</p> <p>D-RMO3: provide a certificate to accompany the scrap metal shipment as evidence that the shipment has been checked for the presence of radiation</p>	<p>Trainees from the companies that are at <u>decision-making levels</u> should be able to:</p> <ul style="list-style-type: none"> - know where to place monitors - know which type of monitor applies best to their given situation <p>Trainees from the companies that are responsible for <u>day to day operations</u> should be able to:</p>
D-RMO6: provide appropriate training in radiation monitoring and initial response procedures for personnel	<ul style="list-style-type: none"> - using monitors - interpreting results - know how to complete a certificate and produce a report summarising the monitoring outcome
D-RMO4: ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures	<p>Trainees should be able to:</p> <ul style="list-style-type: none"> - develop QA procedures for the good working of the detection systems
D-RMO5: arrange for periodic calibration and testing of the detectors (at least annually)	<p>They may also have the ability to:</p> <ul style="list-style-type: none"> - test monitors and - calibrate monitors <p>(although this can be done by external radiation protection experts or by the providers of the detectors)</p>
D-RMO7: establish a response plan for action in the event of radioactive scrap metal being discovered	<p>Trainees from the companies that are responsible for <u>day to day operations</u> should know what are the steps to take once an alarm is triggered, including:</p>

<p>D-RMO8: make formal arrangements with a national organization with expertise in radiation monitoring and radiation protection:</p> <ul style="list-style-type: none"> - to provide training of personnel in radiation detection and response procedures, and - to provide assistance in the event of a radiation incident 	<ul style="list-style-type: none"> - carrying out preliminary investigations based on monitoring results - taking appropriate actions based on monitoring results - reporting quickly and efficiently to the relevant authority <p>Trainees from the companies that are at decision-making levels should be able to:</p> <ul style="list-style-type: none"> - develop appropriate QA procedure - develop an appropriate training and communication programme for the staff of the company - know which are the relevant authorities, institutions (radiation protection experts, etc.) to contact
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Table 9: Recommendations on Detection for: OWNERS OF MAJOR SCRAP YARDS, PROCESSING FACILITIES & MELTING PLANTS

<u>Recommendations on Detection for owners of major scrap yards, processing facilities and melting plant</u>	<u>Expected capacity</u>
<p>Owners of major scrap yards, processing facilities and melting plant should:</p>	
<p>D-RMS1: ensure incoming and outgoing shipments are checked by administrative and visual means</p>	<p>Trainees from the companies that are responsible for day to day operations should be able to:</p> <ul style="list-style-type: none"> - visually recognize radioactivity warning signs, sources and their housings <p>Trainees from the companies that are at decision-making levels should be able to:</p> <ul style="list-style-type: none"> - make a risk analysis of different sources of scrap metal
<p>D-RMS2: provide radiation monitors at all entrances/exits to the premises and, as appropriate, on conveyors and grapples</p>	<p>Trainees from the companies that are responsible for day to day operations should know what are the steps to take once an alarm is triggered, including:</p> <ul style="list-style-type: none"> - using monitors - interpreting results - knowing how to complete a certificate and produce a report summarising the monitoring outcome
<p>D-RMS9: Specifically for <u>Owners of melting plants</u> who should provide arrangements for the radiation monitoring of production waste systems, including monitoring of slag and dust collectors</p>	
<p>D-RMS5: provide appropriate training in radiation monitoring and initial response procedures for personnel likely to be involved in the monitoring of scrap metal shipments</p>	<ul style="list-style-type: none"> - carrying out preliminary investigations based on monitoring results
<p>D-RMS6: establish a response plan for action in the event of radioactive material being discovered</p>	<ul style="list-style-type: none"> - taking appropriate actions based on monitoring results - reporting quickly and efficiently to the relevant authority

<p>D-RMS7: make a formal arrangement with experts in radiation monitoring and radiation protection to provide:</p> <ul style="list-style-type: none"> • training of personnel on radiation detection and response procedures, • assistance in the event of a radiation incident involving the detection of radioactive scrap metal 	<p>Trainees from the companies that are at <u>decision-making levels</u> should be able to:</p> <ul style="list-style-type: none"> - know where to place monitors - know which type of monitor applies best to their given situation - develop appropriate QA procedure - develop an appropriate training and communication programme for the staff of the company - know which are the relevant authorities, institutions (radiation protection experts, etc.) to contact
<p>D-RMS3: ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures</p>	<p>Trainees should be able to:</p> <ul style="list-style-type: none"> - develop QA procedures for the good working of the detection systems.
<p>D-RMS4: arrange for periodic calibration and testing of the detectors</p>	<p>They may also have the ability to:</p> <ul style="list-style-type: none"> - test monitors and - calibrate monitors <p>(although this can be done by external radiation protection experts or by the providers of the detectors)</p>

3. Response

Table 10: Recommendations on Response for: STAFF TRAINED IN RADIATION MONITORING & PROTECTION

<u>Recommendations on Response for members of staff of the facility trained in radiation monitoring and radiation protection</u>	<u>Expected capacity</u>
Members of staff of the facility trained in radiation monitoring and radiation protection, should,	
R-RA1: when a radiation alarm in a monitor is triggered and the result has been checked and verified, carry out a preliminary investigation of the situation	<p>Trainees should know what are the first steps to take once an alarm is triggered, including:</p> <ul style="list-style-type: none"> - performing thorough tests to ensure the veracity of an alarm - isolating the source - knowing what to wear when dealing with the source - knowing how to handle the source - knowing where to place the source - knowing how to transport the source safely - knowing how to rope off the potentially contaminated site - knowing how to complete a report for the regulatory body

Table 11: Recommendations on Response for: OWNERS OF COMPANIES FROM WHICH SCRAP METAL SHIPMENTS ORIGINATE

<u>Recommendations on Response for owners or managers of the companies from which scrap metal shipments originate</u>	<u>Expected capacity</u>
Owners or managers of the companies from which scrap metal shipments originate should	
R-RA2: on being alerted of radiation levels in excess of the “Response Level” or of radioactive contamination being detected, contact the external radiation protection experts to safely locate and remove the radioactive source and/or determine any radioactive contamination	<p>Trainees should be able to respond to an incident with radiation levels above a “response level”, including:</p> <ul style="list-style-type: none"> - knowing whom to contact and what to report - knowing how to complete a report for the regulatory body
R-RA3: on being alerted of a verified radiation alarm with radiation levels in excess of the “Response Level” or of radioactive contamination, notify the regulatory body promptly and provide it with the report of the radiation protection experts	<ul style="list-style-type: none"> - knowing how to handle the source - knowing where to place the source
R-RA4: on being alerted of a verified radiation alarm with levels in excess of the “Response Level” or of radioactive contamination, ensure that the material is placed in a safe and secure location pending its disposal	<ul style="list-style-type: none"> - informing staff about all the above

Table 12: Recommendations on Response for: OWNERS OR MANAGERS OF SCRAP YARDS, MELTING OR PROCESSING FACILITIES

<u>Recommendations on Response for owners or managers of scrap yards, melting or processing facilities</u>	<u>Expected capacity</u>
Owners or managers of scrap yards, melting or processing facilities should:	
R-RA2: on being alerted of radiation levels in excess of the “Response Level” or of radioactive contamination being detected, contact the external radiation protection experts to safely locate and remove the radioactive source and/or determine the presence and extent of any radioactive contamination	<p>Trainees should be able to respond to an incident with radiation levels above a “response level”, including:</p> <ul style="list-style-type: none"> - knowing whom to contact and what to report - knowing how to complete a report for the regulatory body - knowing how to handle the source - knowing where to place the source - informing staff about all the above
R-RA3: on being alerted of a verified radiation alarm with radiation levels in excess of the “Response Level” or of radioactive contamination, notify the regulatory body promptly and provide it with the report of the radiation protection experts	
R-RA4: on being alerted of a verified radiation alarm with levels in excess of the “Response Level” or of radioactive contamination, ensure that the material is placed in a safe and secure location pending its disposal	
R-MDM2: contact the national organization responsible for radioactive waste management and request assistance in disposing of the radioactive material	
R-NR1: promptly notify the responsible national authorities in the event of a radiation incident involving radioactive material in scrap metal, metal product or production waste	
R-MDM3: if there is radioactive contamination present on surfaces, request the assistance of those responsible for radioactive waste management to decontaminate the affected areas and to dispose of any radioactive waste produced in the operation	
R-MDM1: request the last owner of the shipment containing radioactive scrap metal to take it back, provided that the last owner is competent to safely manage the radioactive material	<p>Trainees should have the skills to:</p> <ul style="list-style-type: none"> - develop a communication network inside the sector
R-MDM4: ensure that any movement of radioactive material is done with the approval of the national competent authority for the safe transport of radioactive material	<p>Trainees should know:</p> <ul style="list-style-type: none"> - whom to contact - how to complete a report

Table 13: Recommendations on Response for: CUSTOMS

<u>Recommendations on Response for Customs</u>	<u>Expected capacity</u>
Customs and border officials should:	
R-RA2: on being alerted of radiation levels in excess of the “Response Level” or of radioactive contamination, contact the external radiation protection experts to safely locate and remove the radioactive source and/or determine any radioactive contamination	<p>Trainees should be able to respond to an incident with radiation levels above a “response level”, including:</p> <ul style="list-style-type: none"> - knowing what to wear when dealing with the sources - knowing whom to contact and what to report - knowing how to complete a report for the regulatory body - knowing how to handle the source - knowing where to place the source
R-RA3: on being alerted of a verified radiation alarm with radiation levels in excess of the “Response Level” or of radioactive contamination, notify the regulatory body promptly and provide it with the report of the radiation protection experts	
R-RA4: on being alerted of a verified radiation alarm with levels in excess of the “Response Level” or of radioactive contamination, ensure that the material is placed in a safe and secure location pending its disposal	
R-NR1: promptly notify the responsible national authorities in the event of a radiation incident involving radioactive material in scrap metal, metal product or production waste	
R-MDM2: contact the national organization responsible for radioactive waste management and request assistance in disposing of the radioactive material	
R-MDM3: if there is radioactive contamination present on surfaces, request the assistance of those responsible for radioactive waste management to decontaminate the affected areas and to dispose of any radioactive waste produced in the operation	
R-MDM1: request the last owner of the shipment containing radioactive scrap metal to take it back, provided that the last owner is competent to safely manage the radioactive material	<p>Trainees should have the skills to:</p> <ul style="list-style-type: none"> - develop a communication network inside the sector
R-MDM4: ensure that any movement of radioactive material is done with the approval of the national competent authority for the safe transport of radioactive material	<p>Trainees should know:</p> <ul style="list-style-type: none"> - whom to contact - how to complete a report

Table 14: Recommendations on Response for:

RELEVANT NATIONAL REGULATORY BODY

<u>Recommendations on Response</u>	<u>Expected capacity</u>
The relevant national regulatory body should:	
R-RA5: provide guidance and advice on procedures to ensure safety in the event of radioactive material being discovered in scrap metal, metal product or waste	<p>Trainees should know the steps to take when radioactive material is discovered in scrap metal including:</p> <ul style="list-style-type: none"> - safe transport - safe storage - decontamination - disposal <p>Trainees should be able to develop procedures to deal with radioactive material in scrap metals</p> <p>Trainees should know which are the main companies and organizations in the relevant sectors and develop a communication programme.</p>
R-RA6: authorize arrangements for the safe storage and disposal of radioactive sources and material, scrap metal, metal product or waste contaminated with radioactive material	

Table 15: Recommendations on Response for:

NATIONAL AUTHORITY FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL

<u>Recommendations on Response</u>	<u>Expected capacity</u>
The national competent authority for the safe transport of radioactive material should:	
R-RA7: provide advice on the requirements for the safe transportation of radioactive material, scrap metal, metal product or waste contaminated with radioactive material	<p>Trainees know how to:</p> <ul style="list-style-type: none"> - safely transport radioactive scrap metal - deliver authorization forms - deal with trans-border issues
R-RA8: issue special authorizations for the safe transport of the recovered material, scrap metal, metal product or waste contaminated with radioactive material	
R-RA9: where possible, and in collaboration with neighbouring States, facilitate the return of radioactive scrap metal across national boundaries	

Table 16: Recommendations on Response for: STATES

<u>Recommendations on Response for States</u>	<u>Expected capacity</u>
States should:	
R-MDM5: have arrangements in place for the safe storage or disposal of radioactive material and waste	Trainees should be able to: <ul style="list-style-type: none"> - design special storage locations for radioactive scrap metal/material - develop TORs for the national body that deals with radioactive scrap metal - develop appropriate regulations for the safe transport of radioactive scrap metal
R-MDM6: have an authorized national body to manage such radioactive material and waste	
R-MDM7: ensure regulations are in place, and are managed by a competent authority, to cover the safe transport of radioactive scrap metal or waste resulting from the disposition of radioactive scrap metal	
R-MDM8: to the extent possible, facilitate the return of radioactive scrap metal across borders	- NA -
R-IR1: immediately report to the IAEA as well as to the potentially affected State or States any incident involving the dispersal of scrap metal containing radioactive material that may have transboundary implications	- NA -

Table 17: Recommendations on Response for: CARRIERS/TRANSPORTERS

<u>Recommendations on Response for carriers/transporters</u>	<u>Expected capacity</u>
Carriers/transporters should:	
R-NR1: promptly notify the responsible national authorities in the event of a radiation incident involving radioactive material in scrap metal, metal product or production waste	Trainees should know reporting procedures, including: <ul style="list-style-type: none"> - whom to report to - what to report - what format to report on - how to report

4. Additional areas

The Recommendations also cover a number of additional areas such as responsibilities, financing and coordination. For more details on these, see Annex I.

B. Capacity Building Activities to Support Effective Implementation of the Recommendations

The purpose of this section of the strategy is to outline possible capacity building activities to support implementation of the recommendations, thereby leading to improved protection of human health and the environment and facilitated trade in scrap metal. The section reviews possible activities at the national and regional levels, as well as guidance and training materials that could be developed. It should be noted that this section applies mainly to countries without adequate infrastructure in place.

1. National Level

The basic elements of a capacity building strategy for managing the radioactive scrap metal problem at a national level would most likely include:

- A situation analysis
- National workshops
- Development of national action plans
- Implementation activities

An important proposed activity at the national level is to develop national action plans to improve management of radioactive scrap metal. The development of national action plans would require a coordinated and systematic (“step-by-step”) approach at the national level involving all stakeholders (government, industry, labour groups, NGOs, etc.) and could, for example, include the following elements:

(a) Baseline Report and Situation Analysis

A national infrastructure assessment provides baseline information about and identifies the magnitude and nature of potential problems related to national management of radioactive scrap metal. Additionally, it provides an analysis of relevant legal, technical and administrative infrastructure with the objective of revealing existing capacities and capabilities, as well as gaps or areas that require strengthening to address the identified problems.

(b) National Workshops

During an initial phase of developing a national action plan, countries may consider organizing a National Workshop, with participation of relevant government ministries, industry representatives, and civil society. The workshop could provide an opportunity to:

- learn about technical aspects of managing radioactive scrap metal (prevention, detection, response), as well as infrastructure which needs to be in place to ensure effective implementation of the Recommendations;
- review the situation/gap analysis;
- initiate development of required legislative reform;
- catalyse capacity development activities for customs authorities, industry and companies, and civil society/labour; and
- develop a timeline for implementation of the Recommendations.

(c) National Strategic Action Plans

A National Action Plan represents a comprehensive strategy which outlines a precise goal and objectives; planned activities; indicators of success; suggested implementation mechanisms; and financial and human resource needs required to strengthen effective contaminated scrap metal management and implement the Recommendations at the national level.

(d) Implementation Activities

Based on the proposals in the national action plan, implementation of specific activities to concretely build capacity to strengthen and effectively manage issues related to radioactive scrap metal, such as strengthening of customs authorities, revision to relevant regulations/legislation, etc.

One approach could be to test this methodology in 3-5 pilot countries. UNITAR has an existing methodology for action plan development that could be adapted to the case of radioactive scrap metal and implementation of the Recommendations (see also section 3). In addition, development of national capacity in this area also has strong potential to be strengthened by the development of public-private partnerships to execute certain activities. The engagement of the private sector should be directly solicited. Table 18 below summarizes these proposed national activities.

Table 18: Summary of Proposed National Support Activities

Activity	Objective(s)	Indicators
Development of Baseline Report and Situation Analysis	Provide baseline information and identify the magnitude and nature of potential problems related to national management of radioactive scrap metal	Completed reports generated and approved by all stakeholders in 2-3 pilot countries
National Workshop	Raise awareness and ensure a better understanding among all interested and affected parties at the national level about the opportunities and challenges related to radioactive scrap metal and implementation of the Recommendations	Multi-stakeholder workshops convened in 2-3 pilot countries
Development of National Strategic Action Plans	Develop a comprehensive radioactive scrap metal strategy with the involvement of interested and affected parties	National Action Plans developed and endorsed in 2-3 pilot countries
Implementation Activities	Assist implementation of priority measures as agreed in the action plan	3-4 priority activities (including legislative changes, training, etc) implemented in 2-3 pilot countries

2. Regional Level

The survey undertaken by UNECE (see section IV.B. above) clearly indicated a need for regional or sub-regional activities to complement the national level initiatives. Two to three regions or subregions could be identified in order to pilot test the proposed methodology and activities.

(a) Regional Implementation and Awareness Raising Workshops

A series of regional workshops has the objective to engage key actors from government, industry and civil society into the process of implementation of the Recommendations and capacity building for improved management of radioactive scrap metal. Other objectives of the workshops include, *inter alia*, to: raise awareness of the importance of sound management of radioactive scrap metal in the region and exchange experiences on “best practices”; examine and develop possible approaches to regional implementation and identify practical ways and means regarding implementation; and formulate an agenda for regional and national implementation involving government, industry and civil society.

(b) Regional Capacity Needs Assessments

Examining capacities and capabilities among countries in a region or sub-region to implement the recommendations can be an important catalyst for national and regional action. A capacity needs assessment activity, which can be coordinated by a regional organization in cooperation with UNITAR/UNECE, will develop and administer questionnaires as well as targeted follow-up interviews. Countries will be requested to coordinate their responses with the input of key ministries, including, *inter alia*, transport, environment, health, industry, and customs. Such assessments will identify a variety of different capacity needs among countries and can illustrate the different starting points various countries within a region may take when considering adoption of the new Recommendations. Review of national legislation could be an important component of this activity.

(c) Regional Implementation Strategies

Building upon the regional needs assessments and workshops, a regional implementation strategy may be developed through collaboration of governments and stakeholders. A strategy report will review regional institutions and structures relevant to implementation of the recommendations, outline national situations regarding capacity for implementation, review capacity needs and develop elements of a regional implementation strategy across key sectors (industry, transport, customs, etc) involving government, industry and civil society. Table 19 below summarizes these proposed regional/international activities.

Table 19: Summary of Proposed Regional Support Activities

Activity	Objective(s)	Indicators
Regional Workshops	Raise awareness and ensure a better understanding among all interested and affected parties at the regional level about the opportunities and challenges related to sound management of radioactive scrap metal and develop proposals for a regional approach to implementation of the recommendations	1-2 regional (or subregional) multistakeholder workshops convened
Regional Capacity Assessments	Provide baseline information and reveal existing capacities, capabilities, and gaps in the legal, technical and administrative infrastructure so as to identify where existing capacities require strengthening	1-2 regional capacity assessments generated and approved by stakeholders
Regional Implementation Strategies	Provide coherent regional implementation strategies through development of multi-stakeholder and multi-sectoral implementation reports	1-2 regional implementation strategies developed

3. Development of Guidance, Training Materials and Supporting Activities

Widespread and effective implementation of the Recommendations will require the adaptation or development and use of guidance, training and resource materials across a number of related subjects. As already noted in section I.A of this document, some of the capacity building issues that need to be addressed include a better understanding of how scrap metal can become contaminated, what to watch out for when collecting scrap metal, what are risky sources of scrap metal etc. National and regional workshops and action plans can help to further determine what are the capacity building needs. Once those needs are identified, it will be necessary to determine what currently exists that can fulfil those needs and what needs to be developed or adjusted to suit this purpose.

Key materials and activities that could help deliver training and capacity building objectives include:

1. adapting existing material (CD, manuals, presentations, fact sheets, guidelines etc.)
2. developing new materials as necessary (e.g. for guidance related to developing a national or regional baseline report and situation/gap analysis; training for development of national action plans, etc.)
3. disseminating existing and new material
4. providing training support
5. exchanging experiences and best practices
6. setting up an informal network or forum enabling relevant actors to share information, best practices, and lessons learned.

VI. RECOMMENDATIONS AND NEXT STEPS

Conclusions

This training/capacity building strategy for the **Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal** provides details on assistance to countries to implement the Recommendations during 2007-2009. It serves as an accompanying document to the Recommendations and is intended to support their widespread use.

Recommendations

The ultimate aim of this capacity building strategy is to ensure that all actors identified in section II C above, in cooperation, and using examples of best practice, have the means to limit the risks of radioactivity occurring in scrap metal and are prepared to deal with the consequences should an incident occur. In order to increase States' ability to deal with such situations, UNITAR and UNECE would like to recommend that this strategy be applied as widely as possible. Countries with existing capacity may need to focus on section V.A, while countries with limited capacity may follow the proposed steps in section V.B.

Next Steps

1. Disseminate the strategy and the Recommendations broadly;
2. Identify five countries and three sub-regions (including development of a set of criteria to help select them) with clear capacity building needs for UNITAR/UNECE to provide more active support in developing their capacity to deal with radioactive scrap metal (subject to availability of resources);
3. Obtain feedback on use of the Recommendations (using the web portal) and ways of improving them, including through results of national and regional capacity building pilot projects;
4. Assess the effectiveness of the strategy and of the Recommendations;
5. Refine the Recommendations as necessary;
6. Further disseminate the Recommendations and further increase capacity.

Annex I: Summary of Specific Recommendations taken from “Recommendations on Monitoring and Response Procedures for Radioactive Scrap Metal”

I. PREVENTION (P)

FIELD OF ACTION: PREVENTION	
	States
Recommendation No.	
P-PO1	X
P-PO2	X
P-PO3	X
P-PO4	X
P-PO5	X
P-PO6	X
P-PO7	X
P-PO8	X
P-PO9	X
P-P1	X
P-P2	X
P-P3	X

Prevention of occurrence (PO)

P-PO1: States should have in place an effective national legislative and regulatory system of control over sealed radioactive sources and radioactive material. This should include a regulatory body to enforce the regulations established within this system;

P-PO2: States should have appropriate facilities, arrangements and services for radiation protection available to persons who are authorized to manage radioactive sources;

P-PO3: States should ensure that adequate arrangements are in place for the training of staff from the regulatory body, law enforcement agencies and emergency service organizations;

P-PO4: States should establish a national register of radioactive sources;

P-PO5: States should ensure that source owners carry out regular checks to confirm that their inventory of radioactive sources is intact;

P-PO6: States should promote awareness of the safety and security hazards associated with orphan sources;

P-PO7: States should emphasize to sealed radioactive source designers, manufacturers, suppliers and users and those managing disused sources their responsibilities for the safety and security of the sources;

P-PO8: States should ensure that the possession, remanufacturing or disposal of disused sealed radioactive sources takes place in a safe manner,

P-PO9: States should provide arrangements for the safe management and disposal of radioactive waste.

Prevention – Preparedness (P-P)

P-P1: States should assess the likelihood of the occurrence of events involving the presence of radioactive scrap metal within the State;

P-P2: States should review and, if necessary, improve national arrangements to counteract the possible presence of radioactive scrap metal. The extent of the arrangements should be proportional to the likelihood of event occurrence and the associated hazard;

P-P3: States should as appropriate, and based on the likelihood assessment, require Customs or border organizations to install radiation monitors for the surveillance of scrap metal shipments at key border points and encourage owners of major scrap metal yards, processing facilities and melting plants to install equipment to monitor incoming shipments and outgoing metal products and waste

II. DETECTION

FIELD OF ACTION: DETECTION				
	STATES		PRIVATE SECTOR	
	States	Customs Authority	Managers/owners of scrap yards, processing facilities, melting plants	Persons responsible for the reception and monitoring of the shipments
Recommendation No.				
D-G1	X			
D-G2	X			
D-RMB1		X		
D-RMB2		X		
D-RMB3		X		
D-RMB4		X		
D-RMB5		X		
D-RMB6		X		
D-RMB7		X		
D-RMO1			X	
D-VM1			X	
D-VM2			X	
D-VM3			X	
D-VM4			X	
D-VM5			X	
D-VM6			X	
D-VM7			X	
D-VM8			X	
D-RMS1			X	
D-RMS2			X	
D-RMS3			X	
D-RMS4			X	
D-RMS5			X	
D-RMS6			X	
D-RMS7			X	
D-RMS8			X	
D-RMS9			X	
D-AM1				X

Detection – General (G)

D-G1: States should ensure that monitoring is carried out at each of the key points of the scrap metal movement within the State. The monitoring should take the form of:

- administrative monitoring, to determine the likelihood that scrap metal shipments contain radioactive scrap metal,
- visual monitoring, to check for the presence of typical radiation warning signs and source housings,
- radiation monitoring, to check radiation levels in the vicinity of the shipment;

D-G2: States should exchange information on monitoring and response arrangement with neighbouring States as a means of improving international harmonization.

Detection - Administrative Monitoring (AM)

D-AM1: Persons responsible for the reception and monitoring of the shipments should be alerted if the shipment:

- arrives without evidence of radiation monitoring having been performed before shipment or during shipment;
- is from a supplier with a previous history involving the supply of radioactive scrap metal; and
- is from a supplier not previously known to the recipient company or the regulatory authorities

Detection - Visual Monitoring (VM)

D-VM1: Scrap yard, processing facility, melting plant and border personnel should be properly trained to visually recognize radioactivity warning signs and the different types of radiation sources and source housings.

Detection - Radiation monitoring at the point of origin (RMO)

D-RMO1: Owners of companies from which scrap metal shipments originate should ensure shipments are checked by administrative and visual means for the possible presence of radioactive scrap metal;

D-RMO2: Owners of companies from which scrap metal shipments originate should perform monitoring of shipments for radiation at the exit of the premises where scrap is collected;

D-RMO3: Owners of companies from which scrap metal shipments originate should provide a certificate to accompany the scrap metal shipment as evidence that the shipment has been checked for the presence of radiation;

D-RMO4: Owners of companies from which scrap metal shipments originate should ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures to verify their ability to detect changes in radiation intensity;

D-RMO5: Owners of companies from which scrap metal shipments originate should arrange for periodic calibration and testing of the detectors (at least annually) to ensure optimum performance;

D-RMO6: Owners of companies from which scrap metal shipments originate should provide appropriate training in radiation monitoring and initial response procedures for the involved personnel;

D-RMO7: Owners of companies from which scrap metal shipments originate should establish a response plan for action in the event of radioactive scrap metal being discovered;

D-RMO8: Owners of companies from which scrap metal shipments originate should make formal arrangements with a national organization with expertise in radiation monitoring and radiation protection:

- to provide training of personnel in radiation detection and response procedures, and
- to provide assistance in the event of a radiation incident involving the detection of radioactive scrap metal.

Detection - Radiation monitoring at borders (RMB)

D-RMB1: Customs or border authorities should ensure that shipments of metal scrap are checked by administrative and visual means;

D-RMB2: Customs or border authorities should perform radiation monitoring at each major road and rail border crossing on shipments of scrap metal;

D-RMB3: Customs or border authorities should ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures to verify the ability to detect changes in radiation intensity;

D-RMB4: Customs or border authorities should arrange for periodic calibration and testing of the detectors (at least annually) to ensure optimum performance;

D-RMB5: Customs or border authorities should provide appropriate training in radiation monitoring and initial response procedures for Customs officers likely to be involved in the monitoring of scrap metal shipments;

D-RMB6: Customs or border authorities should establish a response plan for action in the event of radioactive material being discovered;

D-RMB7: Customs or border authorities should make a formal arrangement with a national organization with expertise in radiation monitoring and radiation protection:

- to provide training of personnel on radiation detection and response procedures, and
- to provide assistance in the event of radiation incidents involving the detection of radioactive scrap metal.

Detection - Radiation monitoring at scrap yards, processing facilities and melting plants (D-RMS)

D-RMS1: Owners of major scrap yards, processing facilities and melting plants should ensure incoming and outgoing shipments are checked by administrative and visual means;

D-RMS2: Owners of major scrap yards, processing facilities and melting plants should provide radiation monitors at the entrance/exit to the premises and, as appropriate, on conveyors and grapples. All entrances and exits should be monitored;

D-RMS3: Owners of major scrap yards, processing facilities and melting plants should ensure the effectiveness of the radiation monitors by appropriate quality assurance procedures to verify the ability to detect changes in radiation intensity;

D-RMS4: Owners of major scrap yards, processing facilities and melting plants should arrange for periodic calibration and testing of the detectors (at least annually) to ensure optimum performance;

D-RMS5: Owners of major scrap yards, processing facilities and melting plants should provide appropriate training in radiation monitoring and initial response procedures for personnel likely to be involved in the monitoring of scrap metal shipments;

D-RMS6: Owners of major scrap yards, processing facilities and melting plants should establish a response plan for action in the event of radioactive material being discovered;

D-RMS7: Owners of major scrap yards, processing facilities and melting plants should make a formal arrangement with a national organization with expertise in radiation monitoring and radiation protection to provide:

- training of personnel on radiation detection and response procedures, and
- assistance in the event of a radiation incident involving the detection of radioactive scrap metal

D-RMS8: Owners of major scrap yards, processing facilities and melting plants should require that contracts for the supply of scrap metal include the condition that any costs associated with radioactive material discovered in shipments will be accepted by the seller unless the original owner of the radioactive source or material can be found;

D-RMS9: Owners of melting plants should provide arrangements for the radiation monitoring of production waste systems, including monitoring of slag and dust collectors.

III. RESPONSE

FIELD OF ACTION: RESPONSE						
	STATES				PRIVATE SECTOR	
	States	Customs Authority	Regulatory authority	Safe Transport authority	Managers/owners of scrap yards, processing facilities, melting plants	Persons responsible for the reception and monitoring of the shipments
Recommendation No.						
R-NR1		X		X	X	
R-RA1					X	
R-RA2					X	
R-RA3					X	
R-RA4					X	
R-RA5			X			
R-RA6			X			
R-RA7				X		
R-RA8				X		
R-RA9				X		
R-MDM1					X	
R-MDM2					X	
R-MDM3					X	
R-MDM4					X	
R-MDM5	X					
R-MDM6	X					
R-MDM7	X					
R-MDM8	X					
R-IR1	X					

Response to an alarm (RA)

R-RA1: Members of staff of the facility trained in radiation monitoring and radiation protection should, when a radiation alarm in a monitor is triggered and the result has been checked and verified, carry out a preliminary investigation of the situation. If they find that the radiation level is **less than a specified “Response Level”** and if no radioactive contamination is detected, they should continue to investigate the situation. They should locate and isolate the radioactive substance so that it will not interfere with the operation of the radiation detection system;

R-RA2 Owners or managers of the companies from which scrap metal shipments originate, Customs or border officials, owners or managers of scrap metal yards, processing facilities or melting plants should, on being alerted by responsible staff of a verified radiation alarm with radiation levels **in excess of the “Response Level”** or of radioactive contamination being detected contact the external radiation protection experts to provide assistance in safely locating and removing the radioactive source or substance from the scrap metal, the melt or the production waste and/or determining the presence and extent of any radioactive contamination;

R-RA3 Owners or managers of the companies from which scrap metal shipments originate, Customs or border officials, owners or managers of scrap metal yards, processing facilities or melting plants should, on being alerted by responsible staff of a verified radiation alarm with radiation levels **in excess of the “Response Level”** or of radioactive contamination being detected notify the regulatory body promptly (by telephone) if the event is judged by the radiation protection experts to be radiologically significant, and, subsequently, provide the regulatory body with the report of the radiation protection experts;

R-RA4: Owners or managers of the companies from which scrap metal shipments originate, Customs or border officials, owners or managers of scrap metal yards, processing facilities or melting plants should, on being alerted by responsible staff of a verified radiation alarm with radiation levels **in excess of the “Response Level”** or of radioactive contamination being detected ensure that the recovered radioactive material is placed in a safe and secure location pending its disposal;

R-RA5: The relevant national regulatory body should provide guidance and advice on procedures to ensure safety in the event of radioactive material being discovered in scrap metal, metal product or waste;

R-RA6: The relevant national regulatory body should authorize arrangements for the safe storage and disposal of radioactive sources and material, scrap metal, metal product or waste contaminated with radioactive material;

R-RA7: The national competent authority for the safe transport of radioactive material should provide advice on the requirements for the safe transportation of radioactive material, scrap metal, metal product or waste contaminated with radioactive material;

R-RA8: The national competent authority for the safe transport of radioactive material should issue special authorizations, as needed, for the safe transport of the recovered material, scrap metal, metal product or waste contaminated with radioactive material;

R-RA9: The national competent authority for the safe transport of radioactive material should where possible, and in collaboration with competent authorities in neighbouring States, facilitate the return of radioactive scrap metal across national boundaries.

Response - Management of detected radioactive material (MDM)

R-MDM1: The owner of the scrap metal yard, processing facility or melting plant or the Customs or border authority should, if possible, request the last owner of the shipment containing radioactive scrap metal to take it back, provided that this action is approved by the relevant national authorities and that the last owner is competent to safely manage the radioactive material on its return;

R-MDM2: The owner of the scrap metal yard, processing facility or melting plant or the Customs or border authority should, if this is not possible, contact the national organization responsible for radioactive waste management and request assistance in disposing of the radioactive material;

R-MDM3: The owner of the scrap metal yard, processing facility or melting plant or the Customs or border authority should, if there is radioactive contamination present on surfaces, request the assistance of the radiation protection experts and/or the national organization responsible for radioactive waste management to decontaminate the affected areas and to dispose of any radioactive waste produced in the decontamination operation;

R-MDM4: The owner of the scrap metal yard, processing facility or melting plant or the Customs or border authority should ensure that any movement of radioactive material is done with the approval of the national competent authority for the safe transport of radioactive material;

R-MDM5: States should have arrangements in place for the safe storage or disposal of radioactive material and waste;

R-MDM6: States should have an authorized national body to manage such radioactive material and waste;

R-MDM7: States should ensure regulations are in place, and are managed by a competent authority, to cover the safe transport of radioactive scrap metal or waste resulting from the disposition of radioactive scrap metal;

R-MDM8: States should to the extent possible, facilitate the return of radioactive scrap metal across borders.

Response – National reporting (NR)

R-NR1: Managers of scrap metal yards, processing facilities and melting plants, Customs or border officials, and carriers should promptly notify the responsible national authorities in the event of a radiation incident involving radioactive material in scrap metal, metal product or production waste.

Response – International reporting (IR)

R-IR1: States should immediately report to the IAEA as well as to the potentially affected State or States any incident involving the dispersal of scrap metal containing radioactive material that may have transboundary implications.

IV. OTHER (O)

	STATES	PRIVATE SECTOR									
	States	Customs Authority	Regulatory authority	Safe Transport authority	Authority Responsible for Radioactive Waste Management	Radiation protection experts	Carrier/ Transporter	Managers/owners of scrap yards, processing facilities, melting plants	Owner	Seller	Buyer
Recom. No.											
O-NR1									X		
O-NR2										X	
O-NR3							X				
O-NR4		X									
O-NR5											X
O-NR6			X								
O-NR7		X								X	X
O-NR8				X							
O-NR9					X						
O-NC1	X	X	X	X	X			X			
O-T1		X					X	X			
O-T2						X					
O-IC1	X										
O-IC2	X										
O-IC3								X			
O-IC4	X							X			
O-CF1											X
O-CF2	X							X			

National Responsibilities (NR)

O-NR1: The owner of radioactive sources or material has obligations under national legislation to keep radioactive sources and material safe and secure while they are in use and for arranging their safe storage, transport or disposal after their period of use. In the event of a radioactive source or material being lost or removed from control, the source or material owner should remain responsible;

O-NR2: The seller of the scrap metal (who is usually the consignor for the shipment) is usually responsible to the buyer of the scrap metal, by contractual obligation or by national regulations, to provide a product free of added radionuclides. If the seller is so contractually or legally bound, the seller should arrange for radiation monitoring to be performed on the scrap metal at the point of origin and to provide a certificate indicating the results of that monitoring. The seller should provide appropriate training of involved staff;

O-NR3: The carrier (or carriers) of the scrap metal could be held responsible for the material being carried, for example, in circumstances where the owner of the shipment is not known. In this and similar situations, the carrier should either monitor the shipment for radiation, or request a certificate from the seller (i.e. the consignor) of the scrap metal that the load has been appropriately monitored;

O-NR4: National Customs or border authorities should be concerned to prevent the import or export of unauthorized and potentially hazardous material and should therefore provide for the radiation monitoring of incoming and outgoing shipments of metal scrap at key border points. They should also provide appropriate training of involved staff;

O-NR5: The buyer of the scrap metal (e.g. the owner of the scrap yard, the processing facility or the melting works) should be sure that the material received is free of added radioactive substance. It is therefore in the buyer's interest to require a certificate indicating that the shipment has been monitored by the seller and, in addition, to arrange for monitoring of the scrap metal as it enters and leaves the premises of the scrap yard, processing facility or melting plant. The buyer should provide appropriate training of involved staff;

O-NR6: The national regulatory body is responsible under national legislation and regulations for the licensing and regulation of radioactive sources and radioactive material and of facilities for their radioactive waste management;

The **regulatory body** also has responsibilities related to ensuring the safety of workers, the public and the environment in the event of radioactive sources or other radioactive material becoming lost or misplaced (for example, in scrap metal). In some countries, these responsibilities may be shared between different national authorities, for example, Government departments dealing with safety, health, and the environment.

The relevant **national regulatory body** or bodies should therefore promulgate appropriate regulations and provide guidance and advice on:

- procedures to ensure safety in the event of the discovery of radioactive scrap metal, and
- the safe storage, transport and disposal of radioactive scrap metal.

O-NR7: The seller, the buyer and the national Customs or border authorities should institute agreements with **national organizations with expertise in radiation monitoring and radiation protection** (or these arrangements may be established by the State) on:

- the provision of advice and training on the detection of radionuclides in scrap metal or metal product and on response procedures; and
- the provision of assistance in the event of incidents involving radioactive material in scrap metal, processed metal or product waste producing radiation levels requiring expert response.

The **seller, the buyer and the national Customs or border authorities** should also be aware of the identity of the relevant national regulatory body (or bodies) so that the regulatory body can be quickly informed in the event of such an incident.

O-NR8: The national competent authority responsible for the safety of the transport of radioactive material should:

- provide advice on the requirements for the safe transport of recovered radioactive sources, radioactive material, radioactively contaminated scrap metal or product and of any resulting radioactive waste;
- issue special authorizations, as needed, for the safe transport of the recovered material or radioactively contaminated scrap metal or product and of any radioactive waste; and
- facilitate the return of radioactive scrap metal and of any radioactive waste across national boundaries, where this is appropriate.

O-NR9: The national organization responsible for radioactive waste management should, when required, provide arrangements for the safe processing and storage or disposal of the radioactive material resulting from any incident involving radioactive scrap metal, metal product or production waste.

National Coordination (NC)

O-NC1: Government ministries, Governmental authorities (safety and Customs or border authorities), agencies competent in radiation protection, transport and waste management and the industry (the metal scrap recycling industry and metal works) should cooperate in resolving problems associated with radioactive scrap metal and products. They should aim to establish a unified national approach with positive incentives and relief measures for all concerned. The example of Spain in this context provides a good model.

International Coordination (IC)

O-IC1: States should promote cooperation between Customs or border authorities in relation to monitoring at borders, for example, by two neighbouring States sharing monitoring facilities, thereby reducing monitoring needs;

O-IC2: States should promote cooperation between involved States' regulatory bodies in the management of incidents involving radioactive scrap metal;

O-IC3: The metal recycling industry should promote cooperation between the industries in different States in providing advance warning of potential problems with scrap metal shipments;

O-IC4: States and the metal recycling industry should encourage industries and Customs or border authorities in neighbouring States to work towards the harmonization of methods and procedures used for detection, thereby increasing confidence that shipments have been effectively monitored for the presence of radiation.

Costs and financing (CF)

O-CF1: The buyer of scrap metal should ensure that a 'polluter pays' clause is contained in all contracts for the purchase of scrap metal;

O-CF2: Government and industry should establish arrangements to assist owners of premises at which radioactive scrap metal or contaminated processed metal has been discovered originating from unidentifiable suppliers, in the recovery operations, the management and disposal of any radioactive waste and any necessary clean-up operations.

Training (T)

O-T1: Owners of companies from which scrap metal shipments originate, Customs or border authorities, owners of scrap metal yards, processing facilities and melting plants, and owners of scrap metal shipment companies should provide appropriate training for the management and workers at border points or facilities where scrap metal, metal product or production waste containing radioactive substances may be found or processed, and for the staff of carriers involved in the shipment of scrap metals. Staff should be:

- informed of the possibility that they may be confronted with scrap metal containing radioactive substances;
- informed of the basic facts about ionizing radiation and its effects;
- advised and trained in the visual detection of sealed radiation sources and their containers;
- trained in the use of fixed and portable radiation detection equipment, as appropriate; and
- trained in the action to be taken in the event of the detection or suspected detection of a radiation source or radioactive substance.

O-T2: The training in radiation protection, monitoring and response should be provided by recognized **radiation protection experts**.

