

NUCLEAR THURSDAYS

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THE RADIOLOGICAL MONITORING PROTOCOL FOR METALLIC PRODUCTS AND CLEARED SCRAP MANAGEMENT

Even though the use of nuclear and radiological techniques is subject to strict controls in most countries, the presence of radioactive material in batches of metallic scrap has been detected with relative frequency in the last few years. This circumstance has motivated the implementation of a series of national and international initiatives aimed at detecting and preventing this type of events, whether they be intentional or involuntary.

The Spanish iron and steel industry is one of the country's most important industrial sectors, and to a great extent it depends on the importation of a very significant amount of metallic scrap that it uses as raw material. Experience has shown that countries that import large amounts of scrap, apart from supporting the mentioned international initiatives, should complement them with other national initiatives to reduce the risks resulting from the presence of radioactive material in scrap.

In this context, the Spanish authorities, together with trade unions and entrepreneurial associations in the metal reclamation and smelting sectors and ENRESA, have signed a voluntary Protocol that defines and implements a national radiological monitoring and control system for scrap materials and their byproducts.

The Protocol defines the obligations and rights of the signatories, and it describes the monitoring and control system and its legal bases, the operation of both specific and other general-purpose radiological monitoring equipment that existed prior to this initiative, the development of radiological training and dissemination plans for professionals in the metal reclamation and smelting sectors, the establishment of effective systems for the safe management of any radioactive materials detected, and the general improvement of the national response system in the event of radiological emergencies. Since the Protocol took effect in November 1999, more than 100 enterprises from the metallurgical (steel, copper, lead and aluminum) sector and metal reclamation sector have ratified it.

The Protocol is a purely Spanish initiative and is a good example of how to apply the concept of self-regulation in the field of risk prevention. Its implementation is yielding positive results, and it has become a customary reference in the international arena in connection with this issue. Last May, the Council of Ministers of the European Union adopted a Resolution, whereby it invited the Member States and the Commission to adopt measures similar to those in the Spanish Protocol to prevent radiological risks in metal recycling.

BACKGROUND

Before the event that occurred in a steelworks in the province of Cadiz in May 1998, the presence of radioactive material in scrap was considered as merely a potential risk in Spain. The event made it clear that this was a real risk that could entail significant personal, environmental and primarily economic consequences.

Before 1998, there was a general concern with this issue that had not materialized in any systematic action, although some steelworks had installed radioactive material detection systems at their entrances and the *Consejo de Seguridad Nuclear* (CSN) had launched an informative campaign to acquaint workers in the metal reclamation and smelting sectors with the risks involved in this activity.

The event that occurred in May 1998 was the express reason why the Ministry of Industry and Energy (MINER)⁽¹⁾ and the CSN set in motion two courses of action based on the following:

- Normalization of the affected facilities
- Development of measures to prevent other similar events in the future

(1) MINER's competencies in this area were assumed by the Ministry of the Economy (MINECO) after the ministerial reorganization of March 2000.

The first of these was implemented with the direct participation of the owner companies of the affected facilities, and the second with the collaboration of the *Federación Española de la Recuperación* (FER), the *Unión de Empresas Siderúrgicas* (UNESID) and the *Empresa Nacional de Residuos Radiactivos S.A.* (ENRESA). These measures have materialized in the metallic material radiological monitoring Protocol, which has proved to be a very useful tool for preventing radiological risks in metal recycling, and at the same time they have provided a suitable framework for the management of cleared metallic materials in nuclear facilities.

SYSTEM DEVELOPMENT

Parliamentary Initiatives

In June 1998, the parliamentary groups of the Popular, Socialist and United Left Parties in Congress called on the Government to develop a specific regulation for radiological control of scrap. In response to these parliamentary initiatives, a study was undertaken to assess the national and international situation and the practices in other countries. This study has led to a series of actions as described below.

Government Actions

In order to develop the preventive measures, MINECO and the *Consejo de Seguridad Nuclear* (CSN) created a Task Force to promote, define and coordinate national actions aimed at preventing radiological risks in industrial metal recycling activities. The task force was composed of technical experts from MINECO, Ministry of Public Works, CSN, ENRESA, FER and UNESID, and it focused on the following courses of action:

- Analyze the national and international situation in terms of radiological risk prevention in metal recycling.
- Propose legal bases for development in Spain of a national radiological monitoring and control system for scrap.
- Promote and coordinate implementation of this system.

In addition, the CSN developed complementary measures of a general nature that helped to improve the national radiological risk prevention system for metal recycling.

Analysis of the International Situation

Before 1998, no international organization with competencies in radiological matters – more specifically the International Atomic Energy Agency (IAEA), the European Commission (EC) and the Nuclear Energy Agency of the OECD (NEA/OECD) – had established specific standards or guidelines applicable to radiological monitoring and control of scrap.

The EC, through the Group of Experts included in Article 31 of the EURATOM Treaty, had issued recommendations on levels of radioactive content that were considered as acceptable for the recycling of scrap from nuclear facilities. The IAEA had issued provisional recommendations for conventional management of solid materials that contain low concentrations of radioactivity, and in collaboration with other international organizations it was preparing a Safety Guideline for preventing illegal international trafficking in radioactive materials.

Radiological scrap monitoring systems had been installed in steelworks, in some metal reclamation centers and on some borders of OECD countries. In almost all cases, the installation was voluntary and based on recommendations of the industry proper or of national or regional organizations responsible for radiological protection.

In short, it could be said that the situation was far from clear, homogeneous or harmonious and that there was no systematic practice for regulation of radiological scrap monitoring on an international or national scale, with the exception of Italy where there was some regulation but not generally applied.

In view of this situation, the Spanish Government, through a letter sent by the Secretary of State for Energy to the EC Industry Commissioner and Environmental Commissioner, requested the EC to adopt measures on a community scale to prevent radiological risks stemming from scrap recycling.

The EC began development of a Directive on radiation source safety and created a group of experts to study the advisability of developing a specific regulation on radiological controls in ports and on borders with third countries. Technicians from MINECO and the CSN took part in the technical work of both community initiatives, and continue to do so today.

On its part, the IAEA drew up an action plan for the purpose of increasing the safety of radiation sources and that included a Code of Conduct for countries, the purpose of which is to in-

crease the effectiveness of the source control system.

Development of the Legal Bases for the National System

Spanish regulations did not specifically address the control of risks stemming from the presence of radioactive material in scrap, nor did they require radiological monitoring, when the Acerinox event occurred. There were also no control functions explicitly assigned in this area to any Administrative Agency.

Around the same time, proceedings to revise the law that regulates CSN funding were under way in Parliament, which included an updating of this Agency's functions. In the final approved version, the new law on CSN finances finally modified its competencies and assigned it the following functions:

- "*inspect, assess, control, report and propose to the competent authority the adoption of all preventive and corrective measures required in exceptional emergency situations... when they originate in facilities, equipment, enterprises or activities not subject to the system of permits provided in nuclear legislation.*

- "*control and monitor the radiological quality of the environment throughout the nation... and collaborate with the competent authorities in matters of environmental radiological monitoring outside the zones of influence of nuclear or radioactive facilities.*"

This same law stipulated that the management of radioactive waste generated under exceptional circumstances could be charged to the financial returns of the fund allotted to radioactive waste management in the cases that MINECO so determined.

To develop the legal provisions, MINER and the CSN created a task force in charge of preparing specific regulations on radiological monitoring and control of scrap and developing the ways to manage radioactive materials detected in scrap.

The Task Force considered two possible alternatives for establishing the regulation: a compulsory regulation, or a collaboration protocol of a voluntary nature that would be endorsed by owner companies of metallic material recycling facilities. Finally, it decided on a voluntary protocol as a preliminary step towards an eventual compulsory regulation, which would be the result of the experience gained on applying the protocol and of the evolution of

international, and especially community, regulations concerning this issue.

On November 2, 1999, MINECO, the Ministry of Public Works, the CSN, ENRESA, UNESID and FER signed the *Collaboration Protocol on Radiological Monitoring of Metallic Products*. Subsequently, the trade unions *Comisiones Obreras* (CCOO) and *Unión General de los Trabajadores* (UGT) joined it, and currently the associations of lead, copper and aluminum smelters and of special and urban waste dump administrators are considering whether to sign the Protocol.

Complementary Measures

The national radiological scrap control system is complemented by other actions of a more far-reaching nature that have recently been upgraded, taking into account during this process the circumstances that lead up to the Protocol.

The CSN has a radiological monitoring program consisting of a network of automatic stations and a network of university laboratories. Its purpose is to permanently monitor the radiological quality of the environment throughout the nation.

The network stations and laboratories have lower levels of detection that are sufficient to guarantee personal health, but their sensitivity threshold is not sufficient to detect environmental contamination caused by fusion of small radiation sources in metal blast furnaces.

The CSN network has been provided with new sampling and analysis stations equipped with highly sensitive equipment, the purpose of which is to detect extremely low levels of radioactivity concentration in the atmosphere. These detection thresholds approach the contamination levels that would be expected in the event of fusion of a relevant radiation source in a blast furnace.

On the other hand, the national response in the event of an emergency with radiological implications is defined in the Basic Nuclear Emergency Plan (PLABEN), which primarily focuses on emergencies that originate in large nuclear facilities but does not specifically address radiological emergency situations of a different origin.

The CSN and Ministry of the Interior are revising the PLABEN and are developing the Basic Radiological Risk Guideline in order to cover a wider range of radiological emergency situations. This Guideline provides for a response to situations caused by events such as the one that occurred in May 1998.

Results of Protocol Application

Almost three years have passed since Protocol signature, and the results of its application have been altogether positive. The Protocol has been endorsed by 62 companies, including the entire iron and steel industry, the major scrap reclamation centers and some aluminum smelters.

THE PROTOCOL

Protocol Contents

The Protocol is a collaboration agreement between the Ministry of Industry and Energy, the Ministry of Public Works, the *Consejo de Seguridad Nuclear* (CSN), the *Empresa Nacional de Residuos Radiactivos S.A.* (ENRESA), the *Federación Española de Recuperación*, the employers' associations in the iron and steel industry (UNESID), and the train unions that are most widely represented in the metallurgical industry (UGT and CCOO). Its purpose is to establish the technical bases of the national radiological risk prevention system for metal recycling.

The Protocol signatories agree to encourage membership in the Protocol of facilities where scrap is processed and its signature by associations in the metal reclamation sector. In addition, they agree to track its enforcement and the evolution of international standards related to this issue, in order to revise and update its contents if necessary.

A facility becomes a member of the Protocol by registering in the Register created for this purpose by MINECO. Registration is voluntary and free of charge, and membership is formalized when MINECO notifies the interested party that it has been included in the Protocol.

The Protocol's Technical Appendix

The Protocol's contents are developed in a Technical Appendix that establishes the commitments assumed by each of the signing parties, which are as follows:

MINECO agrees to:

- Generically authorize the transfer to ENRESA of detected radioactive material, in order to expedite to the utmost the actions required to remove them.
- Create and maintain the Register of Protocol member companies.
- Direct that actions that must be taken if a situation of generalized contamination

or dispersion of radioactive material occurs.

The Ministry of Public Works agrees to:

- Require a certificate for imported scrap, before it is unloaded in a Spanish port, certifying that it has been subjected to radiological control in the country of origin.
- Report any incident concerning this matter to the CSN.

The *Consejo de Seguridad Nuclear* agrees to:

- Issue the technical recommendations and instructions required to implement the Protocol.
- Establish radiological criteria on which the levels of investigation and exemption required for implementing the Protocol should be based.
- Inspect the radiological monitoring and control systems of facilities.
- Advise the different parties on matters regarding the radiological protection of people and the environment.
- Promote and coordinate training and dissemination plans in matters of radiological protection and instrumentation for personnel in companies of the metal reclamation and smelting sectors.

ENRESA agrees to:

- Remove and keep in custody the radioactive materials detected in scrap and byproducts resulting from processing that exceed the exemption levels.
- Technically advise Protocol member companies, especially concerning the return of radioactive material to vendors when they are foreign.
- Collaborate in the training and dissemination plans.
- Sign a contract with member companies to manage any radioactive material found.

Registered companies agree to:

- Establish a radiological monitoring and control system in each facility where scrap is processed and provide it with the technical, human (either its own or from a contracted UTPR), organizational, training and logistic resources required to detect, isolate and analyze radioactive material that may be contained in scrap.
- Require a certificate from their foreign suppliers certifying that the merchandise they supply has been subjected to radiological control before being sent to Spain.

- Adopt the measures required to prevent dispersion of radioactive material and to isolate it before removal.

- Report to the CSN the detection of amounts or concentrations of radioactive material exceeding the exemption levels.

- Transfer to ENRESA the radioactive material that exceeds the exemption levels, for which purpose an appropriate contract will be signed.

- Take all measures within their reach to return the radioactive material detected in their shipments to the foreign vendors.

- Collaborate in training and dissemination plans.

The Technical Appendix also establishes the action procedure, which is basically as follows:

- Subject to radiological monitoring all metallic materials and byproducts resulting from their processing that enter steelworks and scrap processing centers.

- Immobilize shipments and stop processes in which radiation exceeding the investigation levels has been detected.

- Thoroughly inspect shipments or process lines in which radiation exceeding the investigation levels has been detected.

- The inspection will be carried out by personnel with adequate knowledge of radiological protection and instrumentation, and a UTPR should be advised if the detection is made in process materials and in-house capabilities are not available.

- The inspection results shall be included in a report that will explicitly indicate if the radioactive material exceeds the exemption levels.

- Isolate radioactive material that exceeds the exemption levels under safe conditions until it is removed by ENRESA.

- Report to the CSN, attaching the specialist's report.

- The CSN will notify the installation and ENRESA on applicability of the generic Transfer Authorization and will record the event.

- ENRESA will proceed to remove radioactive materials that exceed the exemption levels, under the terms provided in the contract entered into with the member company, and it will keep them in custody until they are returned, transferred to an authorized user or managed as radioactive waste.

- In the event of dispersion of radioactive material, MINECO will establish, with the CSN's advice, the actions that must be taken.

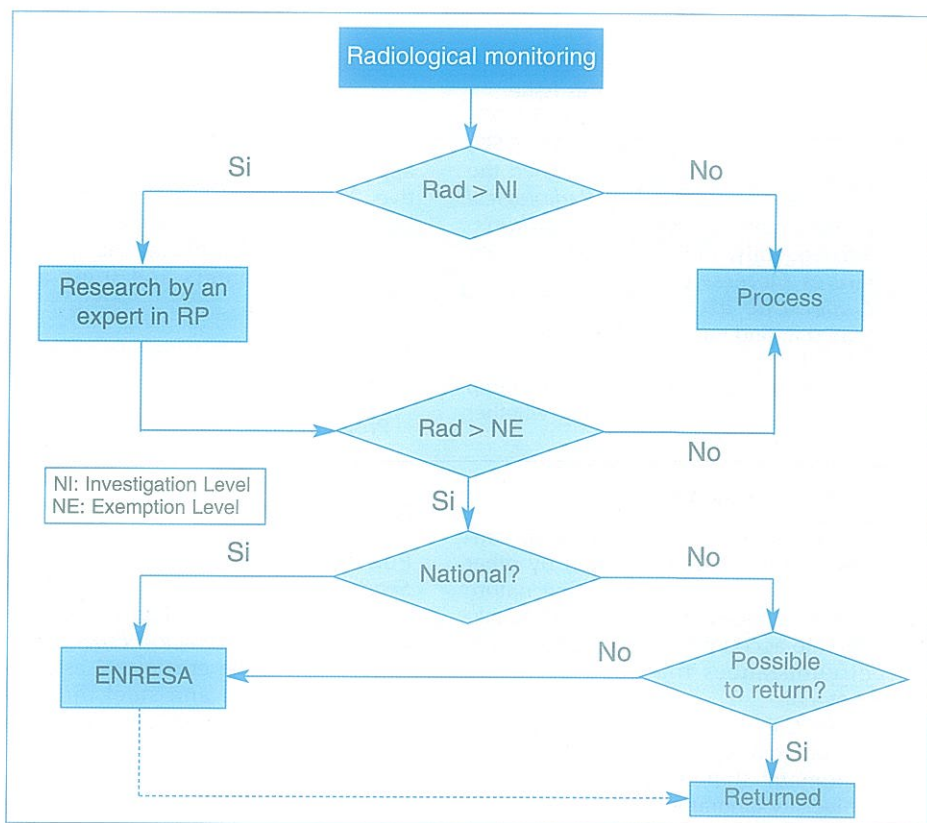


Diagram of actions established by the Protocol in the event of detection of radioactive material in scrap

The Protocol specifies that preliminary actions will be financed by member companies, except those resulting from the detection of radioactive sources of a national origin that will be charged to the ENRESA Fund, and that member companies may charge the costs to third parties.

Complementary Protocol Documents

Practical application of the Protocol is complemented by several specific documents:

- The *Communication of Registration* in the Register of member companies.

- The generic *Transfer Authorization* that establishes the criteria for defining the investigation and exemption levels and other additional precautions that are required to assure the safety of the established system and of the transfer to ENRESA of radioactive materials. The Transfer Authorization enforces the legal provisions in matters of radioactive material transfer.

- A CSN *Safety Guideline* that provides recommendations on the technical specifications of the monitoring and control system, training of specialized technicians, capabilities of the UTPR, etc.

- The *Standard Contract* between ENRESA and member companies that establishes the civil conditions for transferring detected radioactive material.

- The *Communication Formats* for detections covered by the Protocol.

- *Reference Procedures*. ENRESA's Technical Radiological Protection Unit (UTPR) has drawn up reference procedures on how to act when radioactive material is detected in a member facility of the Protocol.

PROTOCOL IMPLEMENTATION

Protocol Tracking

The Protocol created a Tracking Committee to periodically discuss Protocol application, examine possible difficulties and analyze evolution of this issue in the national and international context. The Tracking Committee is composed of representatives of all signing parties and meets twice a year.

The Tracking Committee has a Technical Group to discuss detailed aspects concerning practical application of the Protocol.

Installation of Monitoring Systems

From an instrumental point of view, the Protocol is put into practice by installing radiation detection systems in

C O N C E N T R A T I O N	1000	Significant radiological risk
	100	Required RP
	10	Regulatory exemption levels
	1	Protocol action levels
	0,1	Protocol investigation levels
	0,01	Normal values
Bq/g or Bq/cm ²		

Indicative scale of the levels of CS¹³⁷ contamination used to undertake the actions provided in the Protocol

metal smelting plants and in reclamation centers where scrap is processed (compacted, fragmented, cut, etc.).

The monitoring and control systems of member companies may use different kinds of instruments depending on the dimensions and characteristics of the process developed in them:

- Automatic portal systems, located at plant entrances and exits, to detect radiation in shipments of metallic materials.

- Portable detection systems, for detailed inspection of shipments in which radiation has been detected or for use in small reclamation centers.

- Systems for spectrometry analysis and analysis of samples taken during the process to assure the quality of resulting byproducts.

In addition, beacon type radiation detection systems may be installed in some installations, in areas of special interest.

Simultaneously with the discussions that led up to the Protocol, the steelworks and some scrap warehouses began to install their detection systems so that they would be ready at the time of signature.

At present, there are 62 member companies of the Protocol that belong either to the iron and steel or to the reclamation sector. In October 2001, the first company from the aluminum sector endorsed the Protocol. Detection portals have been installed in all the steelworks and major scrap warehouses, and smaller facilities have manual detection systems.

Radioactive Material Detections

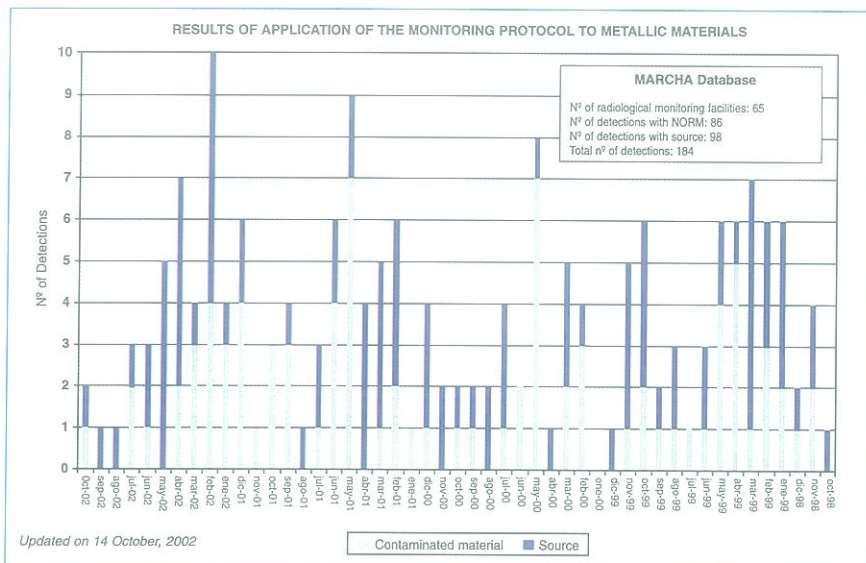
From the very beginning, the effectiveness of the detection systems in steelworks and scrap warehouses was confirmed, and the experience gained from installation of these systems can be qualified as positive. Up to the issue date of this report, the CSN has been informed of 126 detections, which include 57 metallic pieces contaminated with natural radionuclides and 69 radiation sources, 8 of which are category 2 in accordance with the IAEA's classification applied to radiation sources in this context.

In all cases, the protection measures provided in the Protocol and developed in the complementary documents have been applied, and no radiological incident worth mentioning has occurred.

ENRESA has established a plan for removing radioactive materials that are detected and to date all radiation sources have been removed, while some pieces contaminated with natural radionuclides are pending removal.



Automatic and manual radiation detection systems used in metal recycling activities



Time line of the number of detections since installation of detection systems in steelworks

until the study on the specific exemption levels applicable to these materials is concluded.

Training and Dissemination Activities

The Protocol provides for the development of a radiological protection training and dissemination program and of instrumental techniques for the personnel of member facilities. This program consists of three levels:

- One of a *general nature* regarding the bases of radiological protection and the risks stemming from the presence of radioactive material in scrap, targeted at managers and other technicians of steelworks and scrap warehouses. It involves the development of basic training courses.

- One of a *technical nature* regarding instrumental techniques and early actions, targeted at the technicians who must intervene when radioactive material is detected in a scrap shipment. It involves the development of specialized training courses.

- One of an *informative nature*, targeted at all personnel in the metal smelting and reclamation sector, to encourage the prevention of risks caused by the presence of radioactive material in scrap.

The training activities set out in the Protocol have, to date, resulted in the organization of informative seminars attended by iron and steel and reclamation company managers, basic courses attended by iron and steel and

reclamation company technicians, and technical detection courses attended by radiological protection specialists from Technical Radiological Protection Units and from member companies of the Protocol. These courses have been organized by the Institute for Energy Studies of CIEMAT.

In addition, some steelworks have organized informative seminars to explain the Protocol to their suppliers and invite them to become members, and the Metal Division of CCOO included a session on radiological risks in its training seminars on industrial risk prevention held in Asturias.

The CSN has issued a large-format poster with photographic material to be posted in workplaces, for the dual purpose of reminding people of the need to prevent radiological risks and of facilitating identification of radioactive material sources. This poster has been supplemented with a triptych and an informative brochure that explain in detail the objective and contents of the Protocol. All these materials are aimed at people who work in steelworks and large scrap warehouses.

Promotion of the Protocol in Other Industrial Sectors

It is expected that the Protocol will be extended to industrial sectors other than the iron and steel and iron scrap reclamation sectors, which were the ones initially involved. At present, the lead, copper and aluminum sectors and the administrators of municipal waste dumps and special wastes are in the process of becoming members.

The Protocol's Presence in the International Arena

The "Spanish Protocol", as it is known in the international metal recycling sector, has drawn special attention in numerous international forums, both in the metallurgical sector, which particularly values its emphasis on "self-regulation", and in the nuclear sector, which regards it highly for its simplicity and effectiveness. Examples of the interest that the Protocol has aroused in the international arena include the report of the United Nations Economic Commission for Europe (UNECE) and the Resolution of the IAEA's Board of Directors, which considers the Spanish Protocol as an adequate approach to reduce the risks stemming from the presence of radioactive material in scrap.

Likewise, the CSN has received numerous queries from other regulatory bodies on the Protocol contents and the procedure followed up to the time it was signed, for the explicit purpose of taking advantage of the Spanish experience in their respective countries.

The interest aroused by the Protocol in the international arena led the Spanish authorities, during the Spanish Presidency of the European Union in the first half of 2002, to propose a resolution to the Council of Ministers regarding radiological risk prevention in metal recycling.

The contents of the Spanish proposal were submitted to a Meeting that took place in Seville last January, which was attended by representatives of governments, regulatory bodies, metallurgical industries, reclamation firms, trade unions and similar companies from all members states of the EU and the states that have submitted their candidature to become members of the European Union.

In May, the Council of Ministers approved the Resolution, which invites the Member States to implement in their territories a national integrated system along the lines of the Spanish system, and the European Commission to take the actions required to promote and coordinate the national systems.

The Protocol and Clearance of Metallic Waste Material

Many of the difficulties that arose during Protocol preparation resulted from the conceptual divergence between a regulated sector (the nuclear sector) and a non-regulated sector (metallurgical sector), which function in completely different ways. These difficulties were aggravated by the distrust

that radioactivity provokes in sectors not connected in any way to radiological or nuclear technologies.

One example of the difficulties encountered was the search for consistency between the clearance *levels* (maximum admissible level of radioactivity concentration in waste from a nuclear or radioactive facility so that it can be managed as non-radioactive waste) and the exemption *levels* (maximum admissible level of radioactivity concentration in a material so that it can be managed outside a nuclear or radioactive facility).

To resolve this situation, the Protocol exemption level (in practice, this is the maximum radioactivity concentration at which a metallic material can be smelted) was set at the values established as *clearance levels* for metallic materials from nuclear and radioactive facilities. These clearance levels, taken from a European Commission recommendation, have been set to ensure that the management of metallic materials, including cast iron, does not involve any radiological risk.

This solution ensures that metallic materials taken from regulated facilities (nuclear and radioactive) can be processed in conventional facilities (foundries) without any additional radiological control. The adopted solution, which is an entirely correct, rigorous solution from a theoretical and regulatory standpoint, has not been understood in many practical circumstances and situations for social or political reasons, which in all cases have nothing to do with radiological protection.

In this case, the Protocol has become a channel for transparency between both sectors and is making it possible for Spanish steelworks to process cleared metallic materials from nuclear and radioactive facilities, with utmost radiological assurances and based on close trust between both sectors.

Resolution of Outstanding Aspects

Protocol development has shown that there are some technical difficulties that require specific actions. The most significant ones are as follows:

- *Consistency between the alarm levels of automatic detectors*

The alarm levels of automatic detectors depend on where they are located and the algorithms used by the different manufacturers. This circumstance involves a series of difficulties when determining the set point of installed detectors. The Protocol's Technical Group is making a detailed study of in-

stalled automatic detectors to establish the technical criteria on which determination of the set point of each detector in its specific location should be based. This study is due to be completed during the first quarter of 2002. Meanwhile, it has been decided to establish the set points within the radiological fund of the zone plus three typical variations, which are calculated in accordance with the detector manufacturer's recommendations.

- *Determination of a specific exemption level for contamination by natural radionuclides*

Exemption levels define the maximum admissible concentration at which a material can be processed and, complementarily, the minimum level of concentration at which a material can be managed as radioactive waste. On implementing the Protocol, very restrictive exemption levels were set for the dual purpose of strengthening protective measures and of protecting the Spanish metal industry against the importation of scrap with insignificant levels of contamination from a radiological point of view but that could affect commercialization of Spanish metallic products.

This circumstance is especially significant in the case of contamination by natural radionuclides. Based on the adopted levels, the processing of scrap from facilities in which radioactive minerals have been processed is not allowed in Spain. In practice, these levels are extremely low and are frequently exceeded by pieces from the non-nuclear industry that contain natural radionuclides, thus generating certain amounts of waste that must be managed as radioactive waste without resulting in a significant radiological risk.

To revolve this situation, a specific study has been carried out on the radiological impact that the recycling of this type of piece would have, and the final result is a higher exemption level for pieces contaminated with natural radionuclides. This solution is acceptable from a radiological point of view, provided that this type of piece is not frequently found. The study has been based on actual data, and it has been confirmed that the frequency of occurrence makes it possible to raise the exemption levels for recycling of pieces contaminated with natural radionuclides.

- *Definition of exemption levels for batch testing*

Batch testing is the name used for samples taken from the blast furnace

for adjusting the quality of metallic products. The Protocol addresses the radiological monitoring of these samples as an additional safety measure. On the other hand, an analysis of these samples permits manufacturers to ensure that their products are free of radioactivity and provide guarantees to their customers.

The Technical Group, in collaboration with the steelworks that have installed radiological control equipment for batch testing, is analyzing this issue to propose a criterion applicable to the product to assure that it has the commercially required radiological quality.

- *Requirement of a radiological control certificate for imported scrap*

The experience gained on implementing the Protocol has shown that in certain circumstances, e.g. when shipments are from undeveloped countries, it is very hard to obtain a radiological control certificate issued by a recognized entity. Faced with this situation, the Tracking Committee has revisited this Protocol agreement and prepared a Certificate format on which the specific conditions under which the shipment was controlled are recorded.

Once it has been verified that the certificate is fully operative, the Ministry of Public Works, through its Autonomous National Ports Organization, will give instructions to the port authorities on the way they should require the radiological control certificate for imported scrap.

FUTURE PROSPECTS

It can be safely said that the Protocol is fully operative and that the results of its application fulfill the objectives set by MINECO when it created the task force. In this situation, the most significant activities that are expected to be carried out in the future in this area are as follows:

- Resolve outstanding technical aspects of the practical application of the Protocol.

- Extend the Protocol to other industrial sectors such as lead, aluminum and copper recycling.

- By the *Consejo de Seguridad Nuclear*, examine the advisability of extending radiological monitoring, under conditions similar to those adopted in the Protocol, to other sectors such as urban waste dumps and security repositories for toxic and hazardous wastes.