

The background of the slide is a photograph of a modern, multi-story building with a light-colored facade and large windows. A Spanish flag is flying from a pole in front of the building. The scene is captured from a low angle, looking up at the building. The entire image is framed by a blue border.

**EXECUTION OF THE RADIATION PROTECTION LEGISLATION
IN THE NORM INDUSTRY. THE SPANISH EXPERIENCE**

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EAN _{NORM} Workshop.

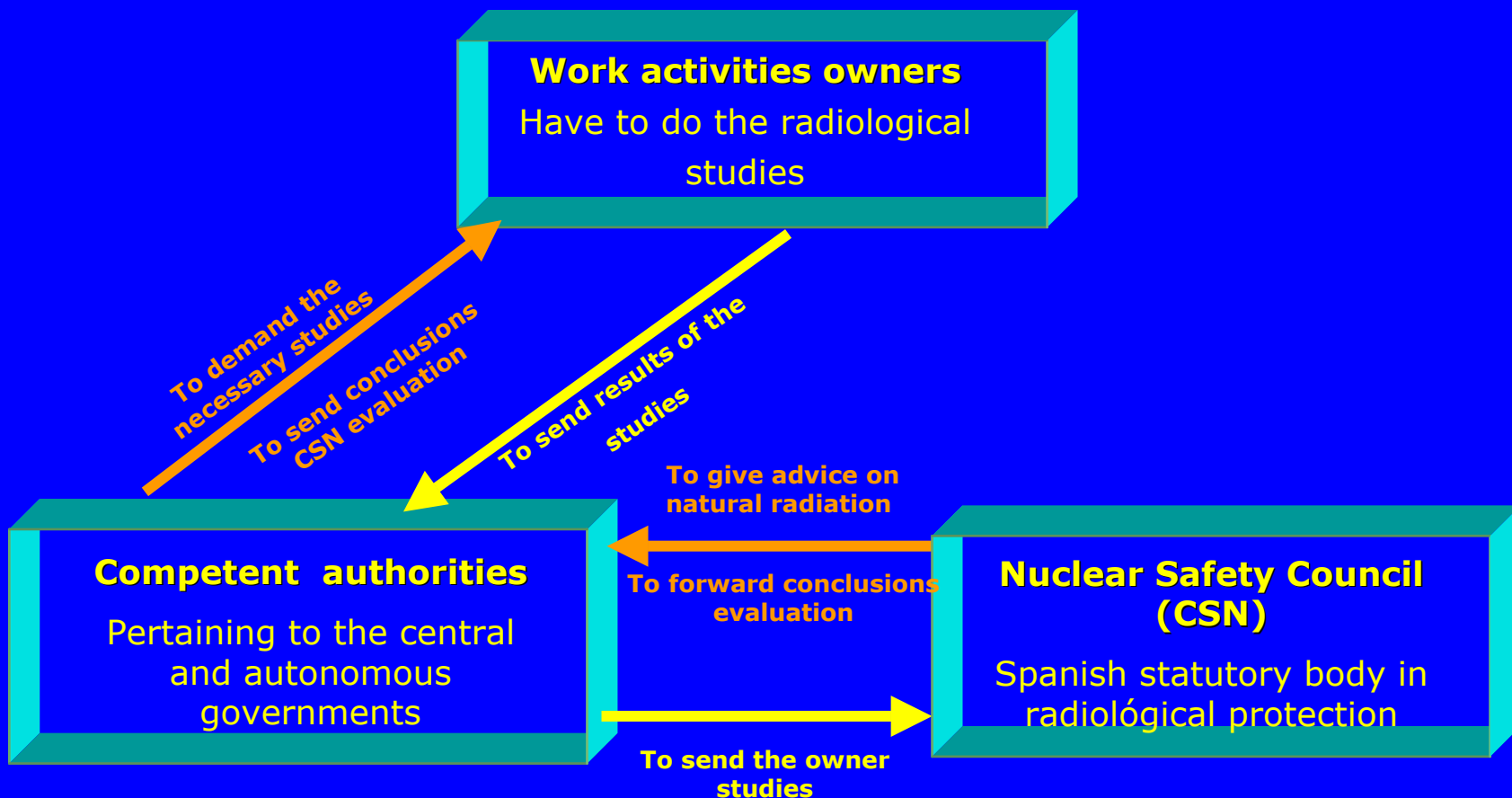
Dresden. 20th-22nd November 2007.

Radiation protection legislation in the NORM industry. Spanish experience.

- **The Euratom 96/29 Directive was transposed into the Spanish legislation in 2001 through the R.D 783/2001 on Health Protection Against Ionizing Radiation (RPSRI).**
- **R.D 783/2001, is the Spanish legislative framework for the protection against ionizing radiation.**
- **Protection from natural radiation sources is defined in Title VII, that is composed of three articles. 62 "Aplication", 63 "Terrestrial sources of natural radiation" and 64 "Aircrew members".**
- **In article 62, the following statement is set out:**

The Competent Authority, advised by the Nuclear Safety Council, will require the owners of work activities within which there is an increased exposure to natural radiation sources, to carry out studies in order to assess the existence of a significant increase in the exposure of workers or members of the public, which cannot be disregarded from the radiation protection point of view.

Radiation protection legislation in the NORM industry. Spanish experience.



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- **The CSN according the results of the studies has to:**
 - **Identify work activities that are of concern and have to be subject to control or to the authorization system.**
 - **Define the work activities that must have appropriate means for monitoring exposure.**
 - **Set up, if necessary, when must be implemented corrective measures to reduce exposures, pursuant to all or part of title VI or the application of radiation protection measures pursuant to all or part of titles II, III, IV and V of the R.D 783/2001.**

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- **In 2002, by the CSN, an action plan was launched for the development and application of Title VII of the RPSRI.**
- **The plan covers the following subjects:**
 - ➔ **Activities involving operations with materials which contain naturally occurring radionuclides- NORM industries.**
 - ➔ **Activities involving the exposure to radon daughters or/and gamma radiation.**
 - ➔ **Aircrew members exposure to cosmic radiation.**
- **Also the plan takes into account, the protection of the Spanish population to radon exposure in dwellings.**

Radiation protection legislation in the NORM industry. Spanish experience.

➤ Non nuclear industries.

→ Phosphate industry (Phosphoric Acid and fertilizers).

→ Mining and processing of metal ores.

✓ Tin, Niobium, Aluminium, Copper, Zinc, Lead.

→ Zircon sands and refractory materials.

✓ Manufacture of wall and floor tiles.

→ Processing of rare earths.

→ Coal-fired power plants.

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➤ **Non nuclear industries.**

→ **Industries of building materials.**

- ✓ **Natural stone quarries/ cement production.**

→ **Manufacture and use of thorium compounds.**

→ **Titanium dioxide pigment industry.**

→ **Oil and gas extraction industry.**

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Projects	Industries studied	Research groups	Period of time
Radiological impact of coal-fired plants	Four biggest Spanish coal-fired plants	Ciemat – Cáceres Univ.	2004-2008
Radiological study of ceramic industries. (Zircon industries)	Zircon sand milling plant. Ceramic frit production plant. Tiles production plant.	Valencia Technical Univ.	2004-2007
Study of the radiological impact produced by some NNI in South Spain.	TiO ₂ production plant. Fertilizer/phosphoric acid production plant.	Huelva- Seville Univ.	2004-2007
Study of the exposure due to the manufacture and use of thorium compounds.	Production and use of: TIG welding rods HID lamps. Gas mantles Optical lenses	Zaragoza- Basque Country Univ.	2004-2008

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- **In general, the pilot studies take into account, the characterization of the following parameters.**
 - **Isotopic activity concentration values in mineral ores, by-products and products of the process.**
 - **Workers exposure levels in different working places, exposure of public members.**
 - **Types of waste produced, volumes, psycho-chemical characteristics, radionuclide activities, potential reutilization.**

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- **At the end of the studies ,it will be indicated to the competent authorities, the existence or not of radiological potential risk for the workers and the public.**
- **Based on the industries studied, a series of documents will be produced, aimed at giving guidance on how to identify the radiological risks.**
- **The documents are going to be edited as Safety Guides by the CSN.**
- **At the current moment , three proposals for guides have been produced.**
 - **Ceramic industry.**
 - **Phosphoric acid and fertilizers plants.**
 - **Titanium dioxide production plants.**

Radiation protection legislation in the NORM industry. Spanish experience.

- **Institutions that are taking part with the CSN in the development of pilot studies in NORM industries.**
 - **Research Centre for Energy, Environment and Technology .CIEMAT.**
 - **Dept.of Atomic,Molecular and Nuclear Physics. Physics Faculty. Seville Univ.**
 - **Dept. of Applied Physic. La Rábida Technical School. Huelva Univ.**
 - **Dept. of Applied and Medical Physics, Faculty of Medicine. Cantabria Univ.**
 - **Dept. Nuclear Engineering and Fluids Mechanics. Basque Country Univ.**
 - **Dept.of Physics. Veterinary Faculty. Cáceres-Extremadura Univ.**
 - **Dept.of Atomic,Molecular and Nuclear Physics. Science Faculty. Zaragoza Univ.**
 - **Environmental Radioactivity Laboratory. Valencia Technical Univ.**

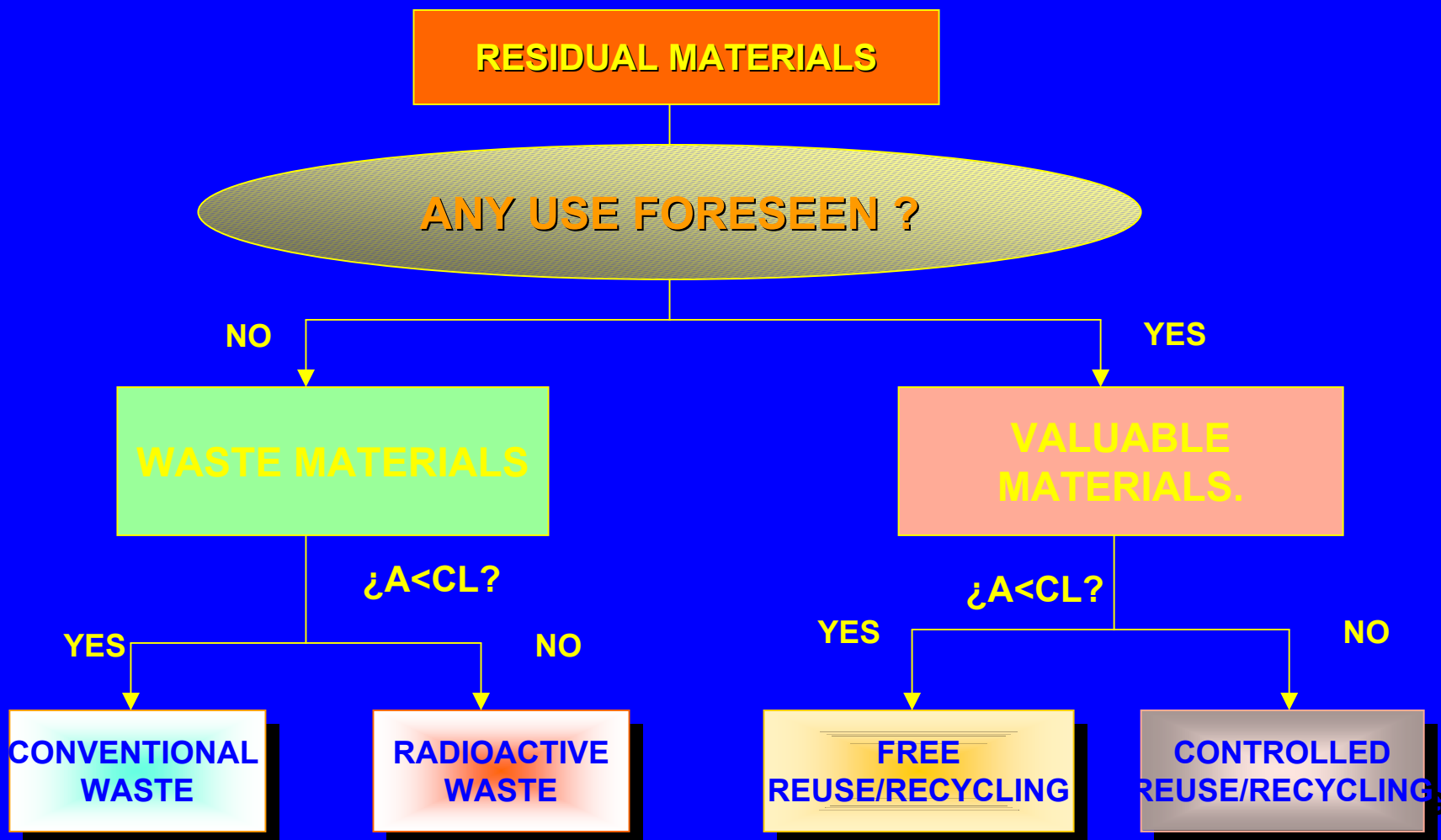
Radiation protection legislation in the NORM industry. Spanish experience.

- **A specific programme for the management of NORM waste is also being developed within the CSN action plan.**
- **At the present moment in the specific case of NORM waste it is necessary to undertake the following actions.**
 - **A suitable regulatory procedure, to identify the number of producers, the amounts and type of wastes and the current management ways.**
 - **A regulatory criterion in order to determine which wastes must be managed under radiological control and which of them in a conventional way.**
 - **A regulatory framework for the management of NORM waste classified as radioactive waste.**

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- **The ongoing action plan on NORM waste, covers the following stages and actions.**
 - **An initial phase, where an analysis of the regulations and the regulatory practice in other countries and of E.U. recommendations has been carried out.**
 - **The intermediate phase, consisting of the development of regulatory criteria and the analysis of the potential impact on industries following its application.**
 - **The implementation phase, will be the application of the legislation to all NORM waste producers involved.**

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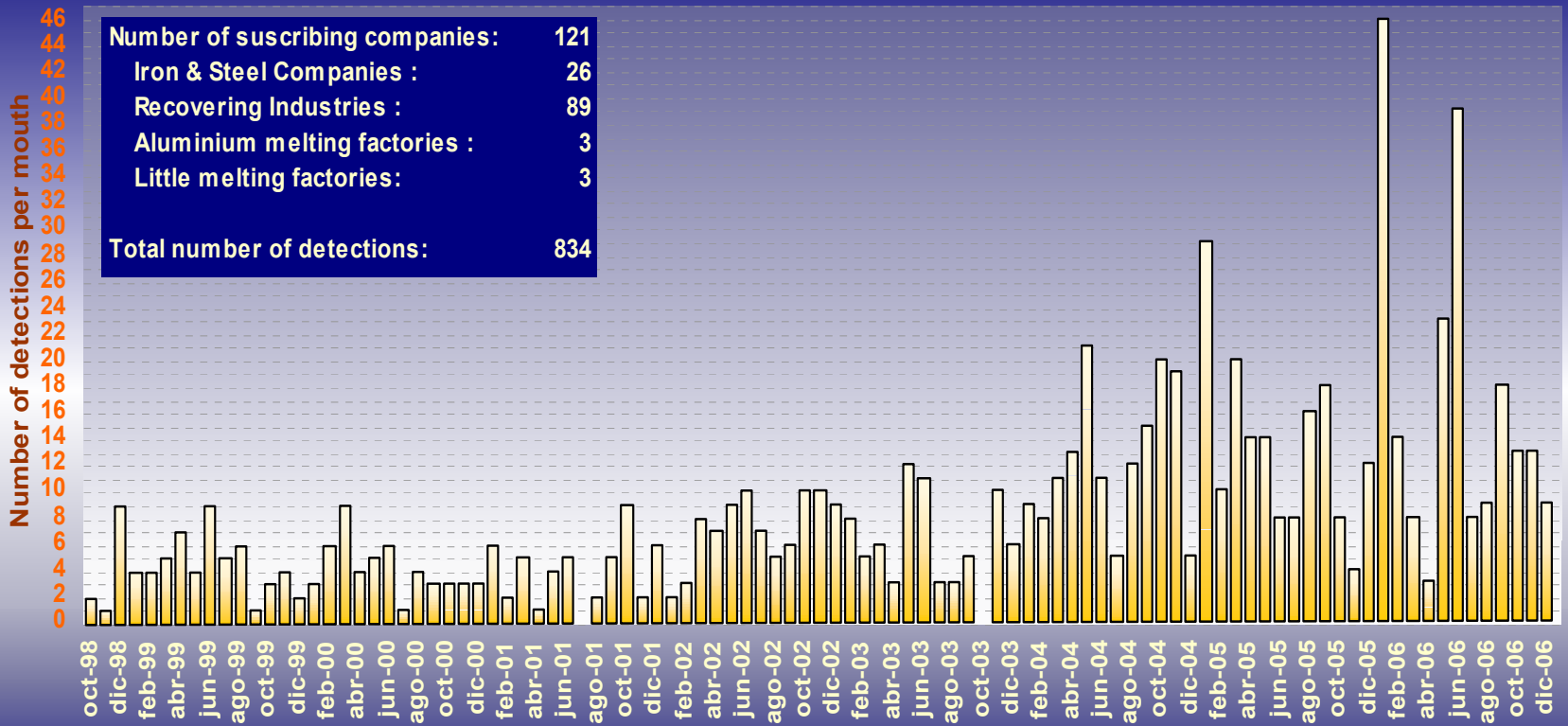
- **In case of NORM waste must be managed with radiological control measures, two options should be considered.**
 - ➔ **The possibility of introducing modifications in the design of conventional waste storage repositories, including radiological control and monitoring.**
 - ➔ **The necessity of putting in place specific management channels and storage for some type of NORM waste.**

Radiation protection legislation in the NORM industry. Spanish experience.

- **Another aspect of NORM issue under consideration, is the detection of radioactive scrap metals by means of the developing of the “*Protocol for radiological surveillance of metal recycling*”**
 - **Protocol is aimed at establishing a national system for prevention of risks arising from the presence of radioactive material in scrap.**
 - **Protocol signed by the Ministries of Industry and Public Works, CSN, the Radiative Waste Management Agency (ENRESA), the Spanish Federation of Recovery (FER), Association of Iron and Steel Companies (UNESID), Aluminium, lead and copper producers.**
 - **By means of the R.D 229/2006 on the control of sealed radioactive sources and orphan sources, the Directive 2003/122 has also been incorporated in the Spanish legislation.**

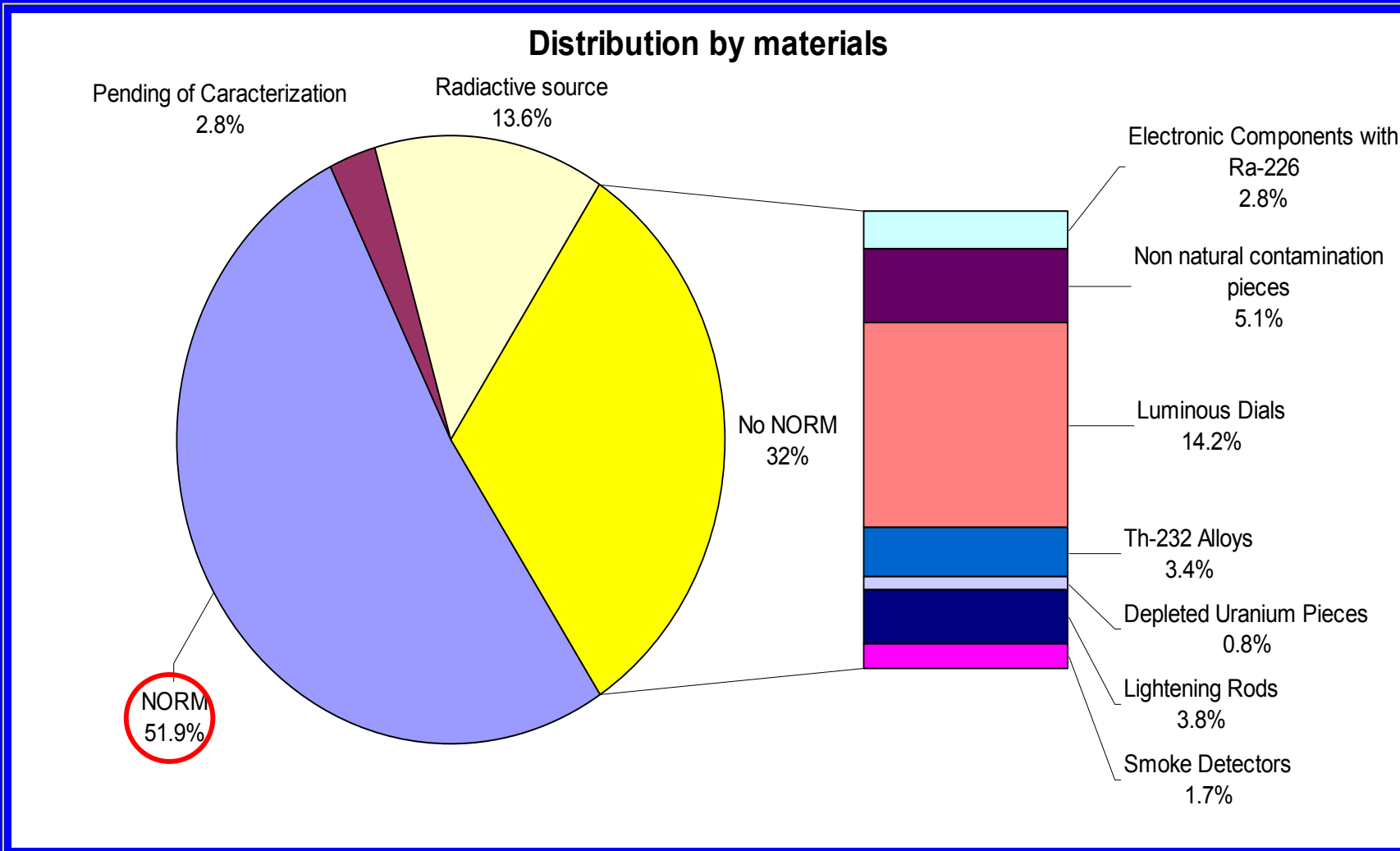
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Total number of detections communicated to the CSN according to Protocol



Updated: December 31, 2006

Radiation protection legislation in the NORM industry. Spanish experience.



Radiation protection legislation in the NORM industry. Spanish experience.

- **Law 20/1986 of May 14, *Relative to toxic and hazardous waste.***
- **Order of July 28, 1989. *About waste from titanium dioxide industry.***
- **Order of April 18, 1991. *Relative to the prevention of contamination produced by waste from the titanium dioxide industry.***
- **Law 31/1995 of November 8. *Relative to labour risk prevention.***
- **Law 10/1998 of April 21. *About waste management.***
- **Law 16/2002 of July 1. *Relative to integrated pollution prevention and control.***
- **R.D 9/2005 of January 14. *Relative to ground potentially polluting activities and the criteria and standards for the contaminated ground declaration.***
- **R.D 824/2005 of July 8. *About fertilizers products.***

Radiation protection legislation in the NORM industry. Spanish experience.

- At the present moment in Spain, no specific regulation on the radiological protection to natural sources exists. For this reason the Technical Direction for Radiological Protection released the document. *“Proposal of radiological protection criteria to natural radiation sources”* .
- The proposal deals primarily with regulating the doses at work by radon exposure and by the use of materials containing NORM. Also this proposal includes regulatory conditions on the accumulation, storage and disposal of radioactive waste produced in the NORM industries.
- Additionally, a proposal on the protection of the public against indoor exposure to radon in dwellings was included.

Radiation protection legislation in the NORM industry. Spanish experience.

Annual dose values	Level of regulation
< 1 mSv	No need to consider regulation.
1 – 6 mSv	A low level of regulation should be applied.
6 – 20 mSv	A high level of regulation should be applied.
> 20 mSv	The process should not be permitted.

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Nuclides	All materials	Wet sludges oil and gas industry
U-238 sec incl. U-235 sec	0.5	5
U nat.	5	100
Th-230	10	100
Ra-226+	0.5	5
Pb-210+	5	100
Po-210	5	100
U-235 sec	1	10
U-235 +	5	50
Pa-231	5	50
Ac-227+	1	10
Th-232 sec	0.5	5
Th-232	5	100
Ra-228+	1	10
Th-228+	0.5	5
K-40	5	100

Exemption/Clearance
Levels
KBq/Kg (Bq/g)

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- **With the adoption of Council Directive 96/29, radiological protection to natural radiation sources, has been explicitly considered for the first time, within the Spanish regulatory framework.**
- **In Spain we are now in a phase of developing progressively this framework, drawing up specific regulation governing the radiological surveillance and control of natural sources.**
- **The approval by the CSN board of the proposal presented, on regulation to protection against natural sources exposure, is the first stage for this developing.**

**THANK YOU
FOR
YOUR ATTENTION**