RADON IN WORKING PLACES. THE CASE OF EXTREMADURA

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Applications of Nuclear Physics

Radon is a naturally occurring radioactive gas emanating from the Earth's surface. It is a colorless and odorless gas, but it can be breathed. Radon, and particularly its isotope ^{222}Rn, is considered by international health organisms as a risk to the human health, and is the second cause of lung cancer, after smoking. In Spain, the *Real Decreto* 783/2001 establishes the Regulation on Health Protection against Ionizing Radiation. For working people, this regulation sets as a standard for protection against exposure of ^{222}Rn a level of annual average concentration of 400 Bq/m^3. In the case in which the working places has some retention of members of the public, this level is lowered to 200 Bq/m^3[1].

The working site is one of the places where perhaps humans spend more time in a day. For this reason, measurements of radon concentration in these places are completely necessary. A monitoring of air radon concentration in workplaces in Extremadura is being performed as a part of a project of R+D in nuclear safety and radiation protection.

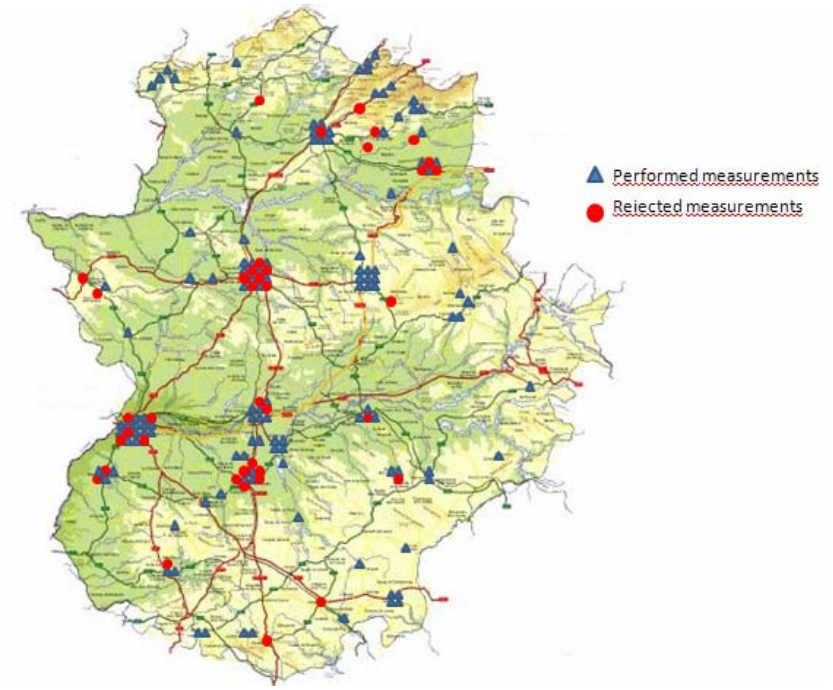

Figure 1. Situation of working places in Extremadura where measurements of ^{222}Rn concentration were considered.

This presentation deals with the "working planning" being developed in this project and some preliminary results from the first measurements carried out. In the first monitoring, 216 companies were contacted but some of them rejected the collaboration with this project (see Fig. 1). Nowadays a total of 205 measurements in 164 different working places have been performed. These determinations were made in underground parking services, warehouses, resorts and spas, caves and mines, museums, hostels, universities, amongst other.

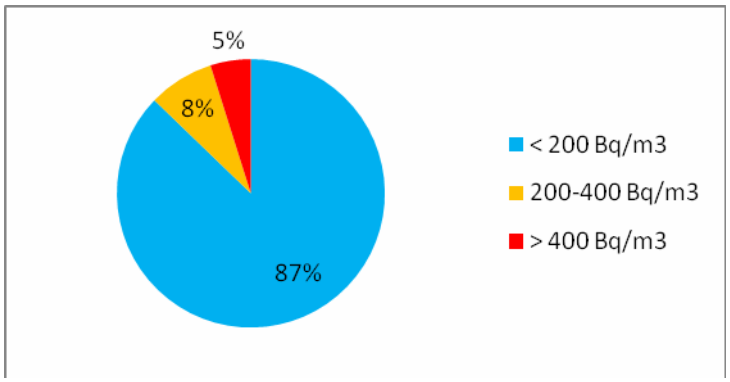

Figure 2. Resume of the results obtained in the measure of ^{222}Rn activity concentration with activated charcoal canisters in working places.

Two different types of detectors have been used. Activated charcoal canisters, with a period of 48 hours exposure [2], for a fast determination, and CR-39 nuclear tracks detectors as integrators to provide a measure for a longer exposure time (three month) [3].

The results reached measuring with activated charcoal detectors at this moment are here presented. More measurements will be performed in the near future. As a comment from the results, 13 % of the analyzed working places exceeded 200 Bq/m3, and 5% were upper than 400 Bq/m3, as shown in Figure 2. This first determination for each case is not representative of the annual average concentration, but it indicates those working places where more control should be taken. In the second phase of this project, places with the greatest concentration will be analyzed with more details, studying time or temperature variations, continuous measurements, with several more sensible devices, etc.

More information on this project can be found on the website: www.rnex.es.

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