

Survey on Occupational Exposure in Industrial Radiography Practice

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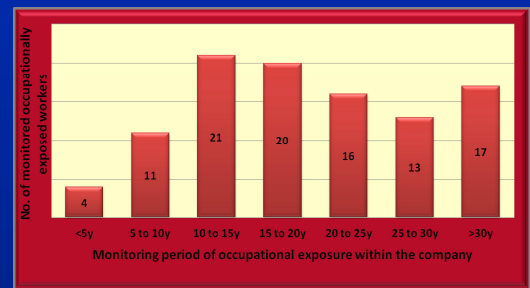
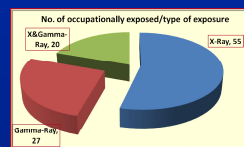
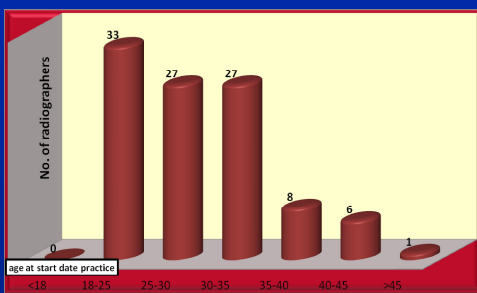


1. Introduction

Romania has a long experience in using radiation sources in industrial radiography. Since the first law and regulations were issued in 1971, the national radiation protection policies have been reviewed to ensure that they reflect international best practice. The radiation protection programmes require the individual monitoring of occupational exposures, the health surveillance of the category A workers, and the workplaces monitoring. Special requirements are enforced by regulations in order to limit the practice with mobile radiological installations outside of the authorized enclosures. The study was performed based on the occupational doses recorded in the Romanian company SC Vulcan SA that being manufacturer for power plant boilers, nuclear components and industrial equipments have developed the industrial radiography practice since more than 30 years.

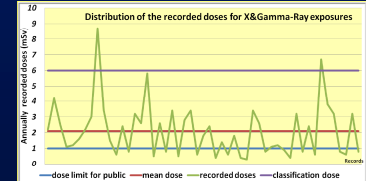
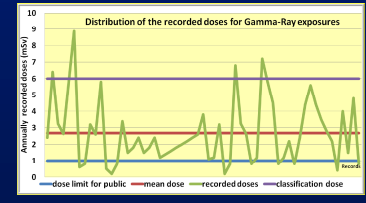
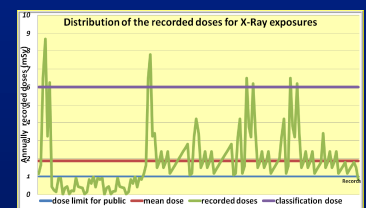
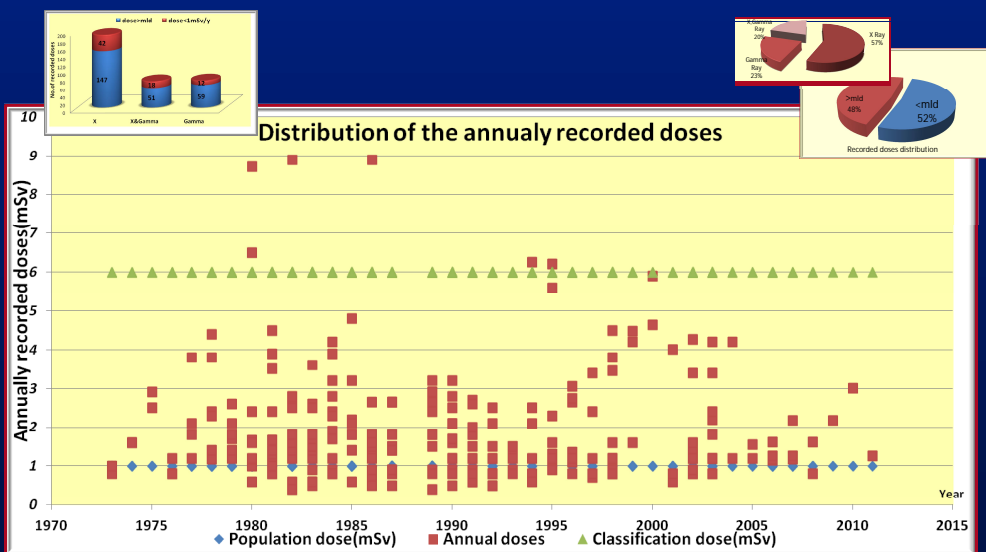
2. Material and Methods

- The assessment was performed based on the doses recorded in the above mentioned company from 1978 to July 2011.
- The available monthly individual external doses reported by the dosimetry laboratory for 102 persons who have operated X-ray machines (max. 420 kV) and gamma installations (^{192}Ir and ^{60}Co ; $\lambda=3.7\text{ TBq}$), were retrospectively analysed.
- Neither a distinguish between fixed and mobile radiography nor establishing a relationships with the laboratories' workload can the study perform when recorded doses were processed.
- All the occupational doses presented in this study are based on the badge film dosimetry carried out using dosimeters type FD-III-B supplied by accredited Dosimetry Services. The results are evaluated and compared with the annual dose limits for workers, which are set by regulations. The annual wholebody dose limit in Romania was 50 mSv for occupationally exposed workers and is 20 mSv since the provisions of the Directive 96/29 Euratom have been implemented in 2000.
- After the doses due to the misuse of the film badge were excluded, a number of 535 mean annual individual doses received as a result of routine operations were analyzed in order to give an indication of whether the techniques are optimized in terms of doses.
- Were noted: the personal data of the workers, type of exposure, the exposure monitoring period within the company, the monthly value of the external dose reported by the dosimetry laboratory for each occupationally exposed worker.



3. Result

Approximately 52% of the analyzed annual mean doses are below the minimum detectable level of the dosimeter. A number of 72 (28%) of the annually recorded doses are less than 1mSv/year. The occupationally exposed workers involved in the radiography practice received whole body doses ranging from 0.1 to 8.9 mSv/year. the highest annual exposure received as a result of routine operations over the mentioned period is below the annual limit of 20 mSv.



4. CONCLUSION

- The existing record keeping system before establishing the National Registry of Doses in 2000 makes difficult to retrieve the necessary records on occupational exposures for statistical studies.
- It is not yet defined an objective system to quantify the contribution of the radiographers workload to the doses they receive.
- When registering doses, it should be established a system to distinguish between the exposures received during the performance of fixed or mobile radiography practice.
- The distribution of doses in the interval from 0.1-8.9 mSv/y placed below of the annual dose limit shows that over the years the company have implemented good work practice.