

Analysis of data on ionizing radiation exposure of employees at the Radiation facility for industrial sterilization ID:157

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Introduction

The Program of protection against ionizing radiation, as a part of the Law on Radiation and Nuclear Safety and Security of the Republic of Serbia, prescribes the obligation to establish individual monitoring of exposed workers. In the Radiation Facility for Industrial Sterilization of the Vinca Institute of Nuclear Sciences (Belgrade-Serbia), TLD dosimeters are used for this purpose. Based on them, the absorbed radiation doses received by employees are read once a month.

Current status in Radiation facility, Vinca Institute, Belgrade

In the Radiation Facility, Co-60 is used as a source of ionizing radiation. The facility has seven employees: four operators, two dosimetrists, and a head of the Radiation Unit. All of them are obliged to wear personal TLD dosimeters whose values are read once a month. These values show us the exposure of individual employees to the effects of ionizing radiation. The paper analyzes the data on the exposure of employees at the radiation unit in the last 5 years. The values of radiation exposure by workplaces, present in mSv/month, are shown in Table 1.

Table 1. Average exposure to ionizing radiation of employees at the Radiation Facility

Employee	Position	Average monthly absorbed radiation dose (January 2017-January 2022) Hp (10), mSv
1	Head of the Radiation Facility	0.16
2	Operator 1	0.15
3	Operator 2	0.15
4	Operator 3	0.16
5	Operator 4	0.16
6	Dosimetrist 1	0.19
7	Dosimetrist 2	0.25

Also, in the plan of the radiation unit, the positions where individual employees mostly stay during their working hours are marked (Figure 1). Based on these results, the level of risk of each work position can be analysed.

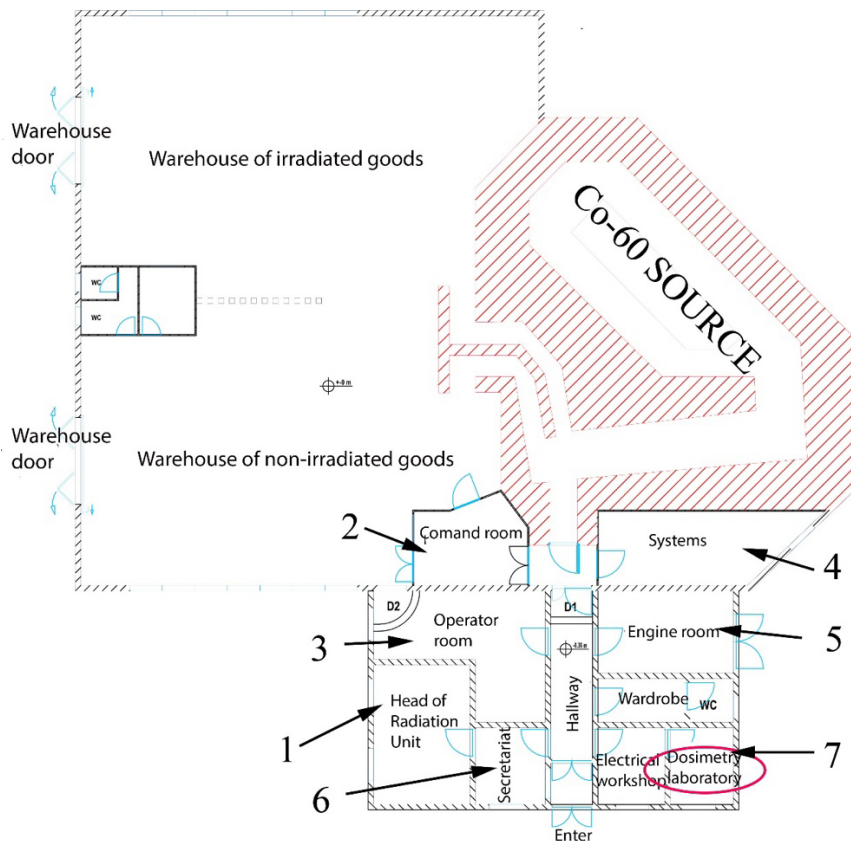


Figure 1. Plan of the radiation facility, with marked workplaces of employees

Conclusions and Acknowledgements

According to the Law on radiation and nuclear safety and security of the Republic of Serbia, the dose of radiation received by professionally exposed persons and individuals from the population must not exceed the prescribed exposure limits. The permissible limit for exposure to radiation for occupationally exposed persons is 20 mSv per year, while the limit for the population is 1 mSv per year. From the table it can be seen that the values to which the employees of the Radiation Unit of the Vinca Institute in Belgrade are exposed are significantly below the permitted values.

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