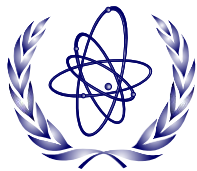


Assessment of Occupational Radiation Exposure in Industrial Radiography in Kenya: Case Study of two Non-Destructive Testing Companies



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1. Background and Goal of the present work

Industrial Radiography is a common non-destructive testing technique used in various industries around the world. In the recent past, there has been an upward trend of radiation sources used in mobile industrial radiography. In Kenya, the practice uses high activity sealed Ir-192 radioactive sources. In this mobile practice, there is a high risk of overexposure to operators, therefore regular personal monitoring and continuous assessment of the radiation protection programmes is necessary.

In Kenya, technologies used for individual effective dose monitoring are TLD, OSL and Film technology. The regulatory authority requires each employer to ensure their staff, who are occupationally exposed to ionizing radiation, are under monitoring program

This paper gives an assessment of effectiveness of radiation protection program of companies involved in industrial radiography practice. The study targeted two companies that participated in carrying out quality control tests of oil pipeline that was under construction in 2018.

2. Materials, Equipment and Methods

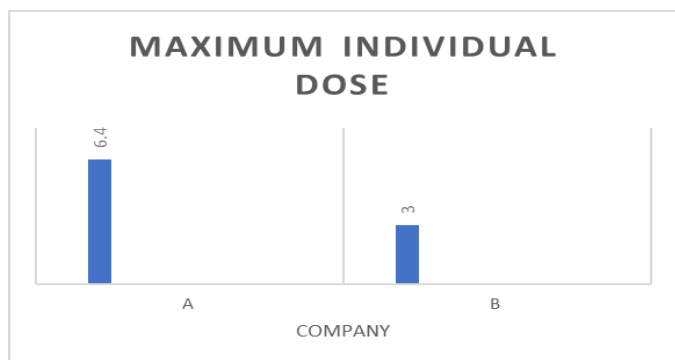
The study examined data for the whole-body dose i.e. Hp (10), from the two companies involved in mobile industrial radiography practice. The data examined was for 2018, when the companies were at the peak of their services in NDT. All the radiation workers from the two companies were monitored using Optically Stimulated Luminescence (OSL) technology.

Average dose for each company was determined, including assessing the monthly dose for each radiation worker and comparing with the recommendations by ICRP [2] and regulatory authority in Kenya.

3. Results

3.1. Average Annual Effective Dose

The result was 6.34 mSv and 3.0 mSv for company A and B respectively.



4. Conclusions and Acknowledgements

There is need of carrying out a study on the trend of occupational radiation protection in the industrial radiography sector in Kenya to ascertain level of effectiveness of radiation protection measures. The regulatory authority needs to review the current regulations to ensure they are in line with the GSR Part 3 and international best practices.

3.2. Average Annual Effective Dose

The maximum individual monthly dose recorded was 6.93 mSv and 2.95 mSv for company A and company B, respectively.



Discussion

The results indicate the exposure for workers from the two companies was below limit recommended by ICRP, of 20 mSv/year. However, the average annual effective dose for each company exceeded the world average [1] of 1.58 mSv. In our neighbouring country, the average for Non-Destructive testing industry was 0.66 to 1.06 for the period between 2011 – 2017 [3]. The maximum monthly dose was recorded in the month of high NDT activity during the construction of oil pipeline.

High doses above the recommended monthly constraint could be due to high workload, lack adequate training and awareness in radiation protection by the radiation workers. This is also attributed by the gaps in the existing regulatory framework in Kenya. There is no requirement in the current regulation for training and refresher training of radiation workers. The requirements for radiation protection programmes are not in line with the international standards.