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Regulatory Control of Occupational Exposure at Radiation Facilities

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INTRODUCTION

Individual monitoring of workers exposed to radiation during their job, and recording their radiation doses are very important for protection of radiation workers from harmful effects of radiation. The National Regulations on Radiation Protection-PAK/904 require the licensee to maintain the records of exposure of radiation workers.

Many countries maintain occupational exposure record of radiation workers in central dose registries at national level. With the increasing movement of workers for performing different types of jobs, the importance of central dose registries becomes even more pronounced.

A typical registry contains personal, employment, and dosimetric data for all the occupationally exposed workers in the country. Such registries enable the optimization of protection and help to ensure compliance with the dose limits at the national level.

The life-time dose data of radiation workers enable authorities to ensure radiation safety of workers and fulfil other legal requirements. All information in a registry is subject to confidentiality requirements.

NATIONAL OCCUPATIONAL EXPOSURE DATABASE

PNRA is maintaining occupational exposure record of radiation workers of radiation facilities in a database at national level.

All radiation facilities are required to monitor doses received by their workers during operation and to submit these records to PNRA on annual basis. This includes information about number of persons exposed and radiation dose received by each worker. Data is also obtained from dosimetry service providers for comparison/verification.

The database is used to evaluate trends in occupational exposures, effectiveness of licensee's radiation protection program and identification of overexposure cases.

At present, dose records of more than 14500 workers of 5952 radiation facilities are maintained in PNRA database Figure-1 provides the number of workers in different facilities.

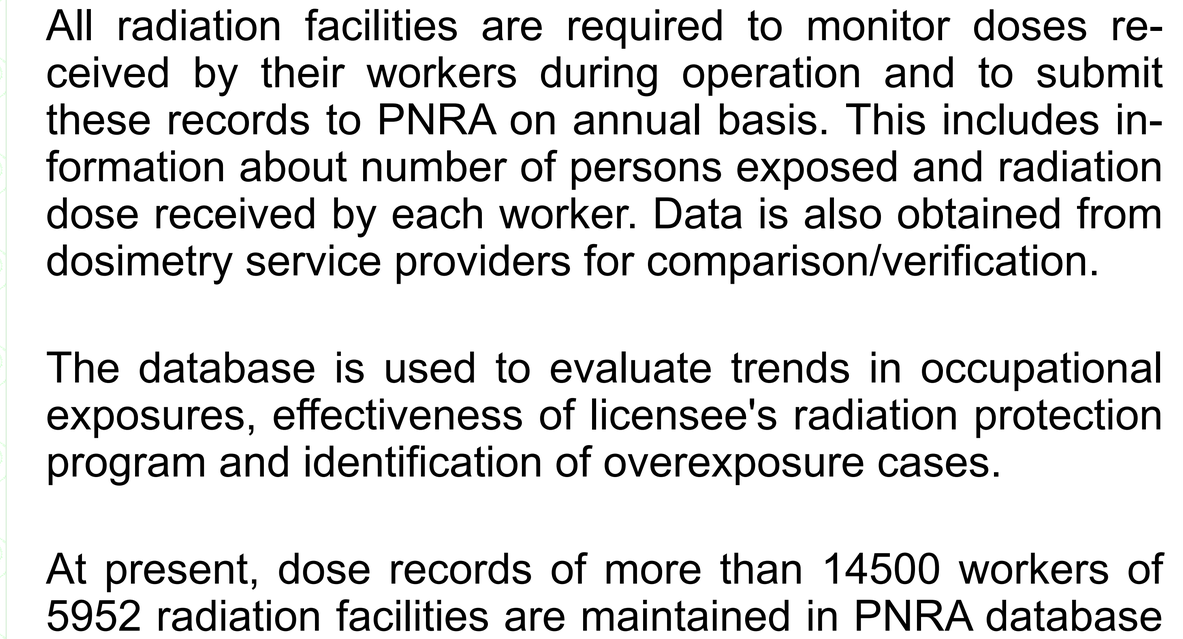

Figure-1: Type of Radiation Facilities and Distribution of Radiation Workers

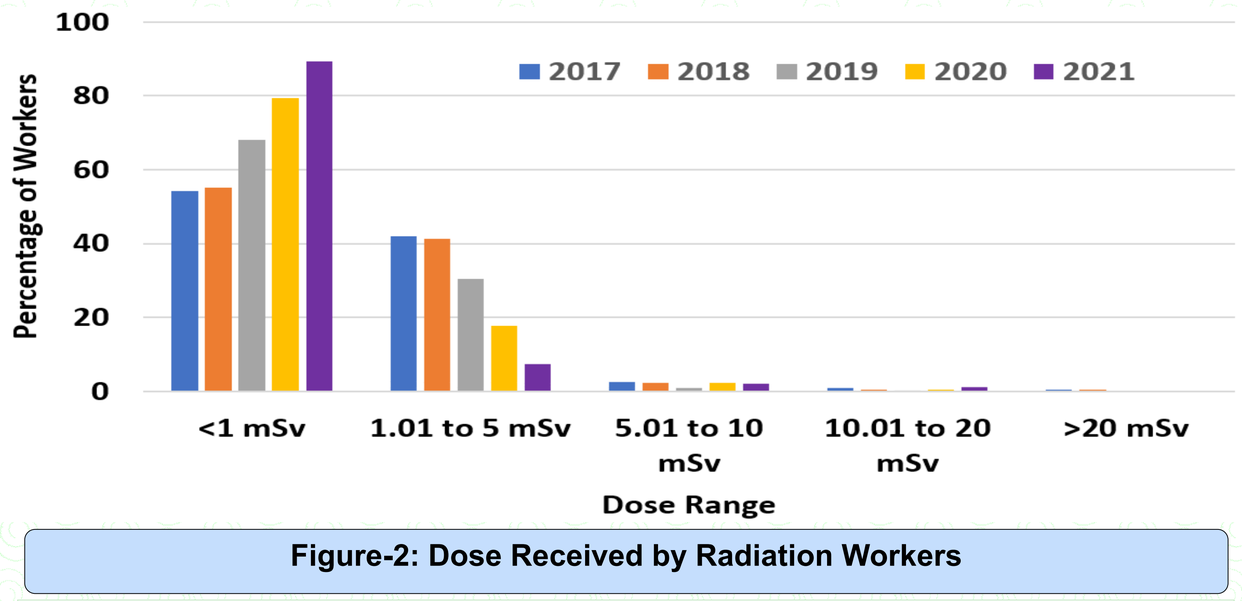

Figure-2: Dose Received by Radiation Workers

Figure-2 shows the trend of doses received by workers. A decreasing trend can be observed in Figure-2 which indicates robustness of radiation protection arrangements at radiation facilities. Most of the workers received doses of less than 1 mSv, however, a small percentage (2%) of workers received doses of more than 10 mSv.

Under the regulations, the maximum dose received can be up to 50 mSv in any single year provided the average 5 years dose does not exceed 20 mSv. The licensees are required to submit investigation reports of overexposure cases to PNRA.

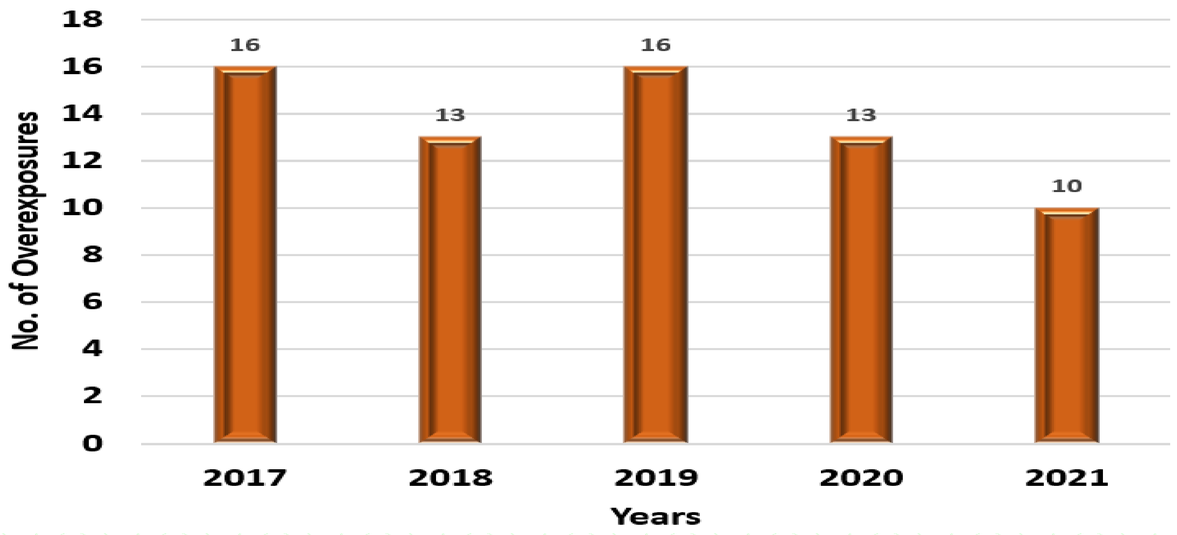

Figure 3: Statistics of Overexposure Cases

Figure 3 reflects that in previous five years, PNRA identified sixty-eight (68) overexposure cases and licensees were directed for investigation. The reasons for higher doses were thoroughly investigated.

The investigation reports on overexposure are reviewed and the licensees are directed to take corrective actions accordingly.

PNRA also conducts special inspections of those facilities which have repetitive overexposure cases to investigate the reason. Furthermore, training courses are arranged and brochures are distributed to aware the workers about the correct use of dosimeters.

CONCLUSION

The assessment of occupational radiation exposure and maintenance of occupational exposure record in national database play a significant role for protection of workers against ionising radiation. However, it is necessary to take rigorous and continuous surveillance and radiation protection measures to keep individual dose as low as reasonably achievable, especially for workers who are found to receive relatively higher doses.

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