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Monitoring and Analysis of Working Area Dose Rate In Radioactive Waste Installation and Interim Storage for Spent Fuel

A radiation monitoring system of working area that continuously measures the dose rate gamma in the room of nuclear and radioactive facilities is an important tool for presenting dose rate information to workers or authorities for radiological protection during normal operations and radiological accidents. We have developed the system in such a way in radioactive and nuclear installation that it consists of 8 NaI(Tl) probe based devices for monitoring dose rate levels in the rooms of Radioactive Waste Installation (RWI) and 5 NaI(Tl) probe in the Interim Storage for Spent Fuel (ISSF). It has been operating since 2020. In this study, a description of the system and the analysis of measured data is presented. Data analysis for the last two years shows that the average dose rate is between 0.15 μ Sv/h-2.52 μ Sv/h, which is still lower than the limit for gamma radiation levels in the working area. If total effective working hours is equal 2000 hours per annual, this value is corresponding to 0.3 mSv-5.04 mSv per annual (less than 20 mSv/a for radiation workers). Time series analysis of the monitoring data shows a good agreement between the increase dose rate in the working area and the presence of the dose rate due to detector testing, also when there is loading activity of receiving disused sealed radioactive sources into containers. These results show that the system is also effective for an early warning system in cases of radiological emergencies.

Name of Member State/Organization

Indonesia

Speakers affiliation

National Research and Innovation Agency (BRIN)

Speakers email

adi_w@batan.go.id

Author: Mr WIJAYANTO, Adi (Directorate of Nuclear Facility Management-National Research and Innovation Agency (BRIN))

Co-author: Mr SUSILA, I Putu (Center for Research of Radiation Detection Technology and Nuclear Analysis--National Research and Innovation (BRIN))

Presenter: Mr WIJAYANTO, Adi (Directorate of Nuclear Facility Management-National Research and Innovation Agency (BRIN))

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