RADIATION TOXICOLOGY RESEARCH DIVISION

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The division has been mainly involved in radiation safety measures with the aim of preventing nuclear related accidents and promoting high standard of protection and research on environmental health. During 2015, services such as regular monitoring for safety of personnel, area monitoring for safety of work place and radioactive waste storage and disposal were carried out.

RESEARCH PROJECTS

1. ENVIRONMENTAL HEALTH

1.1. Determination of the natural radioactivity distribution level of groundwater in Ayeyarwady Region

Radon (222_{Rn}) is the heaviest gas in the natural decay series of Uranium, Thorium and Actinium. It generates radioactive progeny and then eventually to stable Lead (Pb). The exposure of population to high concentrations of radon and its daughters (progenies) for a long period lead to pathological effects such as the respiratory functional changes and the occurrence of lung cancer and also lead to a significant risk of the stomach and gastrointestinal cancer. Human beings are exposed to radon through inhalation and ingestion. In this research, the total Annual Effective Dose in inhalation and ingestion per person of natural radionuclide content from various public tube well water samples were evaluated with World Health Organization (WHO) and European Council (EU) recommended parameters formula. This is a cross-sectional community-based descriptive study. RAD 7, DURRIDGE Electronic Radon Detector was used for measurement of the radionuclide concentrations in mean, standard deviation and median values. The purpose of this study is to find out the radon level of public tube well water being used for drinking and domestic usage in the selected area of Kyon Pyaw Township, Ayeyarwady Region. All water samples were sampled only once. Approximately 250ml of each water sample was collected with quality control procedure. Collected 50 water samples were indicated the presence of Radon and their progenies content in public tube wells. The calculated values of Radon Concentration Rate varied from 21.4 Bqm^{-3} from 2380 Bqm^{-3} and Total Annual Effective Dose varied from 0.53µSv/y to 2.66µSv/y respectively. All results were lower than the WHO and EU guidance level of the Total Annual Effective dose 0.1mSv/y (100µSv/y).

1.2. Determination of Radon concentration in soil at Shwekyin Township, Bago Region

Radon is naturally occurring radioactive gas found throughout our environment. It comes from the natural decay of uranium that is found in nearly all soils. People are mainly exposed to radon through breathing air. Radon is the largest and most variable contributor of public exposure to radiation. In Myanmar, the radon concentration in cement, tile and color cement types of floor at ground and 1st floors of newly constructed buildings have been tested by using 'Can Technique' which employed alpha sensitive LR 115 Type 2 Solid State Nuclear Track Detector (SSNDT). All radon concentrations detected were within the acceptable range of 500-1500 Bqm^{-3} in work places as recommended by International Commission on Radiological Protection (ICRP). The biggest gold vein in the world has been discovered in Myanmar. High grade gold presently being extracted in large quantities from Shwe Kyin gold mines are part of that vein. Inhalation of radon decay products in poorly ventilated underground mines can lead to exposures in excess of current radiation exposure limits, and this could cause high incidence of lung cancer in mine workers. The radon concentration in soil from gold mine and villages near the gold mine area is important to measure and to prevent health effect from radon for mine workers and villagers who live near the gold mine. In this study, 100 soil samples were collected with different depths (25 cm, 50 cm and 75 cm) from old gold mine, new gold mine and villages near the gold mine area Shwe Kyin Township, Bago Region. These selected samples were tested by using LR115 type 2 Solid State Nuclear Track Detector (SSNTD) and RAD 7 Electronic Radon Detector. Although the radon concentration in each place does not change significantly with depth, that of concentration depends on places. The variation of radon concentrations at old gold mine areas were 1495 Bqm^{-3} to 1599 Bqm^{-3}, in new gold mine areas were from 1688 Bqm^{-3} to 2518 Bqm^{-3}, villages near the gold mine areas were from 530 Bqm^{-3} to 854 Bqm^{-3}. The radon at old gold mine areas and new gold mine areas were greater than the acceptable range of 500-1500 Bqm^{-3} in work places as recommended by International Commission on Radiological Protection (ICRP) but the radon concentration detected in selected soil samples from villages near the gold mine areas were within the acceptable range.

SERVICES PROVIDED

ACADEMIC

Sr.	Name	Course	Responsibility
1.	Daw Win Thaw Tar Lwin	Workshop on Research Methodology (2015)	Facilitator