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 2016, 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. Identification of the potential radiation risk of indoor radon in old buildings of Pabedan Township, Yangon Region

Radon is a heavy gas and tends to accumulate in basements or in other low places in the buildings. In this cross-sectional study, indoor radon concentration was measured in ground floors of 50 old buildings from Pabedan Township in Yangon Region and then calculated the level of Annual Effective Dose of indoor radon. Pabedan Township was selected purposively because of the most crowded area with predominance of old buildings. Fifty ground floors in Pabedan Township were randomly selected by lot drawing. Permission was obtained from householders (resident) of that selected buildings (apartment). Radon concentration in indoor air was measured directly using by RAD7 Electronic Radon Detector in the living room of ground floor apartment. Some behaviors of the inhabitants that can affect indoor radon concentration were asked by a short interview for 5 minutes to householder (resident). The total duration was 1hour. The action level of the indoor radon concentration set by Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants (NESHAPs) is 48 Bqm^{-3}. The mean value of radon concentration was 18.8 Bqm^{-3} (3.0 ±1.3 Bqm^{-3} to 84.8 ±7.0 Bqm^{-3}). International Commission on Radiological Protection (ICRP) and National Commission on Radiological Protection (NCRP) have recommended the limit to be $5mSvy^{-1}$received from radon and its progency above which it can be health hazard. The mean value of Annual Effective Dose for indoor radon was $0.5mSvy^{-1}$ ($0.076mSvy^{-1}$ to $2.16mSvy^{-1}$) that is calculated by using formula of International Commission on Radiological Protection (ICRP). The radon concentration in 28% of the buildings (14/50) was higher than 48 Bqm^{-3} which is the action level set by

NESHAPs. Increased radon concentration (>48 Bqm^{-3}) was found out in apartments with bare concrete floor (26%), age of buildings (60yrs & above age) (42%), with smaller room size (<2000 sqft) and poor ventilation (less opening status of windows (88% of buildings), no air-conditioners or exhaust fans. This study highlighted the health knowledge of the ventilation and floor types as important for reducing ways of radon exposure in old building to prevent detrimental long term respiratory disorders. Findings will be beneficial for developing action plan to reduce the potential radiation risk in old buildings.

		Mean value	
		Radon Concentration (Bqm^{-3})	Annual Effective Dose ($mSvy^{-1}$)
Floor type	1.Bare concrete	63.37±5.5	1.59
	2.Others	17.09±3.7	0.43
Building age	1.≥60 years	38.71±5.1	0.97
	2.<60 years	8.77±3.4	0.22
Opening status of windows			
	1.Always	10.52±4.7	0.26
	2.Never	31.66±5.6	0.80
Room size	1.>2000 sqft	19.27±4.2	0.48
	2.<2000 sqft	38.22±4.9	0.96