

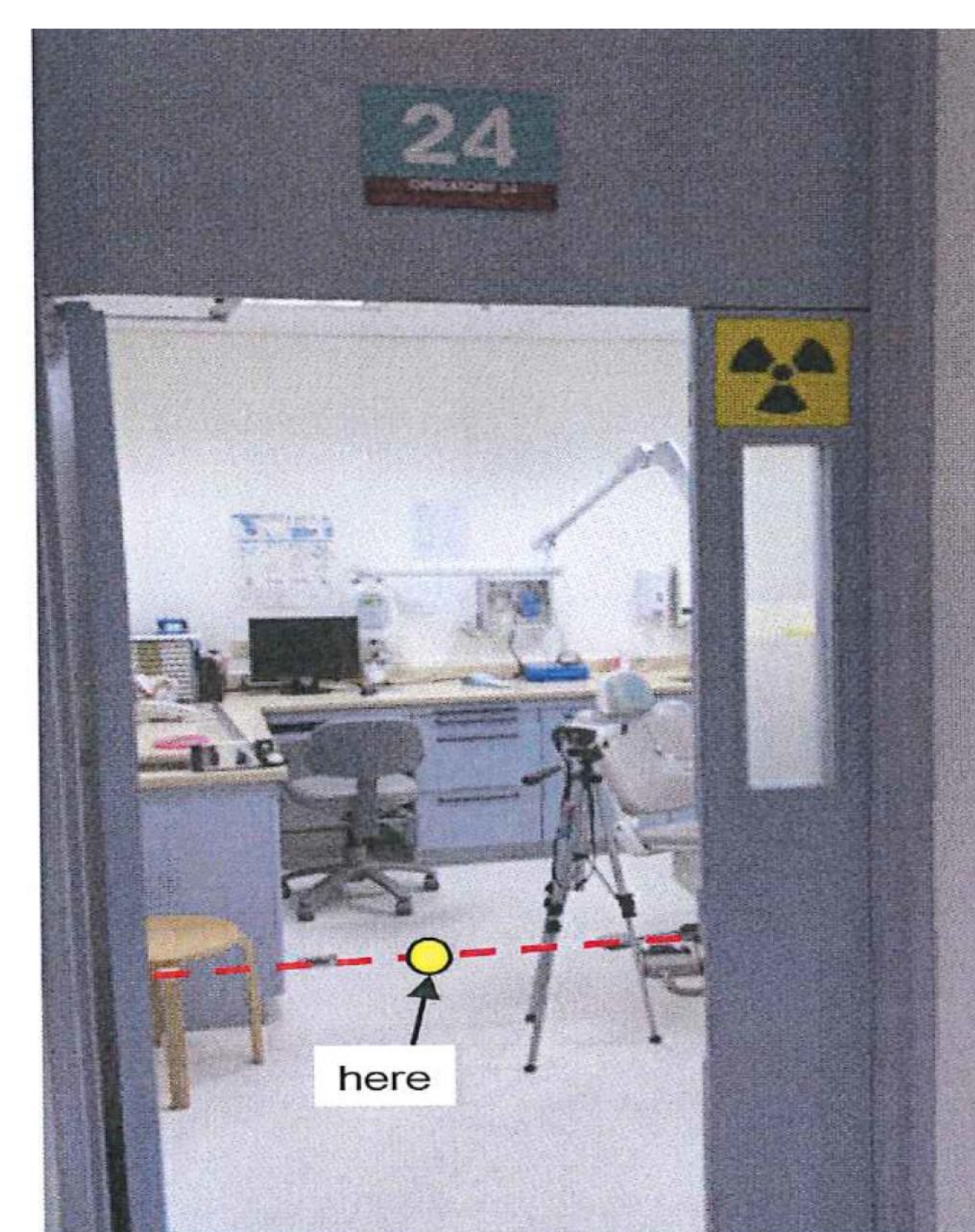
Ionising Radiation Survey For Lead Lining Works

Aims

- To reduce the cost of lead lining in the design of Dental X-Ray suite and no need of lead lining for Dental Operatory
- To proof that there is no need for lead lined walls for Dental Operatory installed with Intra-Oral X-Ray unit

Methodology

- A) Radiation Protection (Ionising Radiation) Regulations (2000) Part Xi 34(b): Nowhere outside the X-ray Room accessible to any individual shall have a radiation level exceeding $10\mu\text{Sv/h}$ while the X-ray machine is being operated at its maximum rated current for the maximum rated voltage at its normal operating positions.
- B) To measure radiation level at various points inside/outside a dental operatory room.
- Point of entry to the operatory
 - Within 1m to 2m away from X-Ray source
 - Within the room at ceiling height (2.8m)
 - Outside the door way with door opened and closed
 - The room next to the source of X-Ray source
- C) Certified equipment used throughout the survey:
- RADOS MP Survey Meter RDS-110 s/n: 270141 (Cal Due Date: 04 Nov 15)
 - RADOS MP Survey Meter RDS-110 s/n: 270223 (Cal Due Date: 04 Nov 15)



Note: For every measurement, the X-Ray unit is set at the maximum operating setting.

Result

- The average dose rate at every measured point was found to be well below the regulatory limit of $1.5\mu\text{Sv/h}$.
- The values measured with door closed and opened are below $10\mu\text{Sv/h}$ of the regulatory limit.
- Awaiting for NEA 's testing and evaluation approval.

Level / Room	System	Serial Number	Setting	1 m	Ceiling	Door closed	Door open
L4 Room 24	Gendex Expert DC	2012097	0.160 sec	0.10	0.11	0.08	0.09
L4 Room 25	Gendex Expert DC	1964023	0.160 sec	0.12	0.10	0.12	0.11
L4 X-ray Room 1	Gendex Orthoralix 9200	5-1840890DF	84 kV, 15 mA	0.08	1.01	0.10	0.07
L5 Room 8	Gendex Expert DC	12-1863569DP	0.160 sec	0.13 (outside window)	0.10	0.08	0.08
L6 Room 4	KaVo 3D Exam	57483	Setting 1 : 3 Voxel/sec Setting 2 : 17.8 sec	0.09	0.07 (above ceiling opening)	-	0.07 (outside door with glass panel)

Conclusion

- With these measurements and results, lead lining for new dental operatory or X-Ray suite can be reduced and thus reduction in construction cost.