

Holistic Radiation Protection

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46th ARPS Conference, Gold Coast Queensland



Our
values



Integrity



Compassion



Accountability



Respect



Excellence



SOUTH
AUSTRALIA
MEDICAL
IMAGING

A have a lot of hats



ARPS South Australia

- > New South Australian Legislation
- > The Regulator – Stakeholder information sessions
- > SA Branch – Three face to face workshops since 2018
- > Radioactive Material:
 - 0.4 Bq/cm² Surface Contamination – SCO Transport Code!
 - 1000 Bq/m³ Radon How do you even regulate it?
- > Draft testing standard that is still in Consultation

Mumbai IRPA Regional Congress

High Standard of Science in India








Air Portable





sahealth.sa.gov.au/sami

Main emissions (keV)					Exemption levels	
	Gamma or X		Beta (Emax)		Electrons	Alpha
	E	%	E	%	E	%
E1	32	6	512	95	624	8
E2	36	1	1173	5	656	1
E3	662	85			660	<1
% omitted	<1		0		<1	

Transport (TBq)	
IAEA ST1 A ₁ value	2E+0
IAEA ST1 A ₂ value	6E-1

EXTERNAL EXPOSURE (mSv.h ⁻¹) for an activity of 1 MBq or 1 MBq.m ⁻² (as appropriate)				
Point source (30 cm)	Infinite plane source	10 ml glass vial	Contact with 50 ml glass beaker	Contact with 5 ml plastic syringe
				
Betas, electrons (skin dose)	Betas, electrons (skin)			
2.13E-1	10 cm 9.0E-02			
	1 m 6.0E-03			
	Photons (skin)			
	10 cm 3.9E-03			
	1 m 2.5E-03			
Gammas, X rays (deep tissue dose)	Photons (deep dose)	100 cm		
1.07E-3	10 cm 3.7E-03	9.19E-5	3.30E-1	1.66E+0
	1 m 2.4E-03			

The values above do not include Bremsstrahlung radiation.

CONTAMINATION		SHIELDING (mm)	
Contamination skin dose (mSv.h ⁻¹)		Betas and electrons (Total absorption)	
Uniform deposit (1kBq.cm ⁻²)	1.57E+0	Glass	2.1
0.05 ml droplet (1 kBq)	7.08E-1	Plastic	3.8
		Gamma and X rays (half and tenth value thickness)	
* If no probes are indicated the recommended technique is to use a wipe test in association with a probe or liquid scintillation technique			¹ / ₂ ¹ / ₁₀
		Lead	8 24
		Steel	29 72

Derived limits (Bq.cm ⁻²)	
Removable contamination	4E+1
Fixed contamination	4E+3

Detection	
Recommended probes*	
Alpha	
Beta	++
Gamma	++
X rays	++

INTERNAL EXPOSURE FOR WORKERS				
COMMITTED EFFECTIVE DOSE PER UNIT INTAKE (Sv.Bq ⁻¹)				
Ingestion	f ₁	Inhalation	1 μm	5 μm
All compounds	1.000	All compounds	F 4.8E-09	6.7E-09
			M	
			S	
Highest d		(Bq) 20 mSv A ₁ inhalation	3.0E+06	(Bq)

RADIIATE LEVEL LABORATORIES (Bq)		
Subject to external exposure requirements which may be more restrictive		
Volatility	Supervised area	Controlled area

Medical Physics Hat

- > Lost Source World News
- > Skin Burns and Radiation Sickness
- > “...exposed long enough, they could also have some acute effects” – Radiation Sickness
- > What?

for review into disappearance of 'dangerous', tiny radioactive capsule in West Australia

9 Jan 2023 at 5:26pm, updated Thu 23 Feb 2023 at 5:59pm



ARPS23

Department of Emergency Services is searching for the radioactive capsule. (Supplied: DFES)

Dead Easy to Find

- > ARPS did some work
 - Don't eat it
- > 20 mSv/h @ 30 cm
- > 20 μ Sv/h @ 10 m
- > Get a Car, a NaI and Drive the road?
- > Instead Disaster Plan

sahealth.sa.gov.au/sami

Standing on the outside, looking in...

My impressions:

- > Did the Chief Health Officer or the Emergency Services even talk to their Subject Matter Experts?
- > Do we lack practitioners with basic Radiation Protection skills that only ANSTO/ARPANSA can save us?
- > Is there oversight of the information given to media?
- > The Thank You... The Apology



Nuclear Subs...

- > Everyone is jumping on board
- > ARPS recognises the need to develop our workforce
- > ARPS is the peak body for radiation protection

Where are we?

- > ICRP are developing a pure system for researchers
- > IAEA translates this into Standards
- > ARPANSA represent Australia for development of Standards
- > States develop legislation with their own particular spin
- > Where are the Practitioner Views?



Collaboration

- > The system is complex
- > Experience is vital
- > Practitioners have Experience
- > Practitioners multiply resources
- > ARPAB skills assessment
- > ARPS access to professionals
- > We need to work together

Collaborate





Government
of South Australia

SA Health



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