

Respiratory Protection: Learning from Operational Experience

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Agenda

- RPE in emergencies
 - Why is it different?
 - So what?
 - What can be done?
- Case study – London, 2006
- Conclusions



VS



Why is it different?

- Environment

- Uncontrolled environment
 - Access, weather, media, the public
- Potentially unknown types of hazard
- Potentially unknown levels of hazard

- Urgency

- There will be a need for urgent action – it's what defines a crisis!

- 'Disaster addiction'

- People will over-perform...their equipment may not



So what...?

- Traditional risk assessment approach is problematic
 - Real-time sampling/analysis of hazard
 - Specialists may have limited experience of wearing RPE
 - Difficult to assess how risks may change as events unfold
 - Assessing collective risk (e.g. dose-sharing) is complicated
- Specifying the correct RPE to match the hazard
 - Competent responders with the right RPE and the right training
 - Infrastructure to support complex RPE will be non-existent
 - Mixed hazards



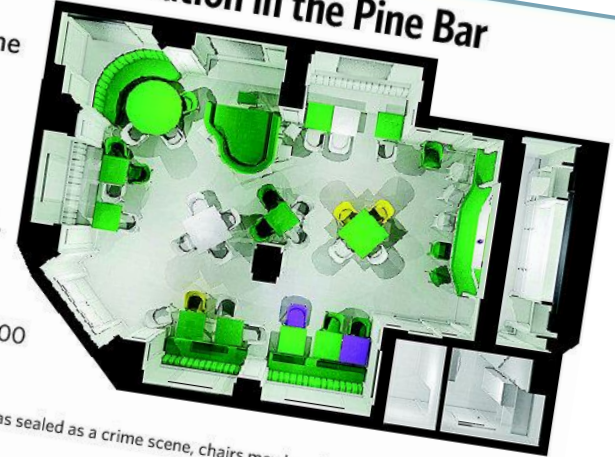
What can be done?

- Flexible risk assessment
 - Consider dynamic hold points
 - Characterise the hazard ASAP
 - Use the 'onion layer' approach to hazard



Alpha radiation contamination in the Pine Bar

A model of the Millennium Hotel's Pine Bar shows, in purple, where Alexander Litvinenko sat and had a drink. * Those areas indicate high levels of radiation contamination.






GEIGER COUNTER COUNTS PER SECOND
1-300
301-3,000
3,001-10,000
>10,000

*According to testimony, before the bar was sealed as a crime scene, chairs may have been moved (yellow).
SOURCE: The Litvinenko Inquiry
THE WASHINGTON POST GRAPHIC

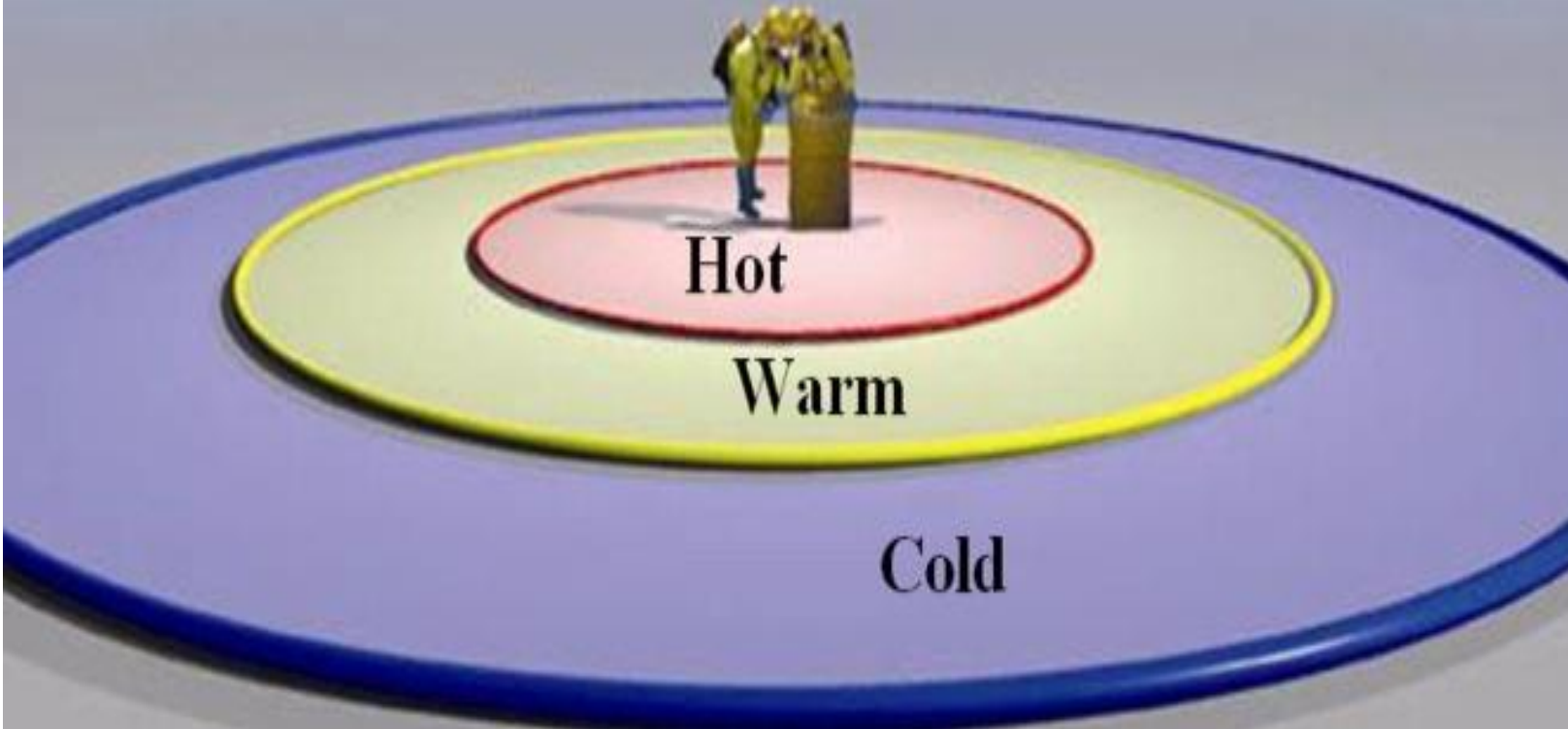


- Using the environment to our advantage
 - Natural barriers (and airflows where possible)
- Align organisational policies where possible



Option	Protection Factor (Assigned (UK))	Wear-time	Operational Burden	Training
PP2 Mask 	10	~4 hours	Very Low (single use, disposable)	Simple (minutes)
S10 respirator 	40	~1 hour	Medium (cleaning, filter change)	Complex (hours)
SCBA 	2000	~10-45 minutes	Very High (cleaning, recharging)	Very complex (hours/days)

Isolation Perimeter



■ The 'warm' zone

- More people
- Fewer specialist tasks



■ The 'hot' zone

- As small as possible...
- ...to ensure safe delivery of tasks



■ 'Extra hot' zone?

- May be required to isolate and manage 'extra hot' areas within 'hot' zone
- May be multiple 'extra hot' zones



Case study – London, 2006

- Multiple scenes (with different hazard profiles)
 - Working hotels, domestic residences, offices, planes, cars,
- Agencies were used to protecting the scene – not themselves
 - RPE/PPE specifications differed
- Contamination ‘Hot Spots’ were often very discrete items (clothing, teapot)
 - Required specialist RPE to recover safely
- Monitoring results shared with multi-agencies
 - Initially - differing policies and risk assessments
- Worried well – media attention – political pressure

Conclusions

- RPE selection and use for emergencies is complex
- Risk assessments to inform RPE must be flexible
 - Expect several iterations
 - May require 'extra hot' zones to be specified
- There may be a need to start with simple RPE/PPE and use hold points
 - i.e. Do what we can...now
- Complex RPE requires complex supporting infrastructure
- People will want to work for longer than their RPE will allow