Peak Inhalation Requirement to maintain Positive Pressure

Edgewood Maryland

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- CEO The SEA Group
- Member of the SF10 Standard Comity Australian standard for RPE
- Involved in many years of research in respiratory related issues.

Peak Inhalation

- The requirement of Peak Inhalation Air flow when simulating Rescue operation at NSW Fire Brigade Training Center in Sydney.
- Performed by Australian army

Conditions

- Sunny Day in January 2001
- The temperature was 28.5 C (83.3F)
- Humidity 51-64%

Equipment used

- SE400 AT Positive Pressure Demand (PAPR)
- SE-EDL Extended Data Logger
- Calibrated to accuracy –5 +10%
- Video Cameras
- All Synchronized

This Group's Taskforce

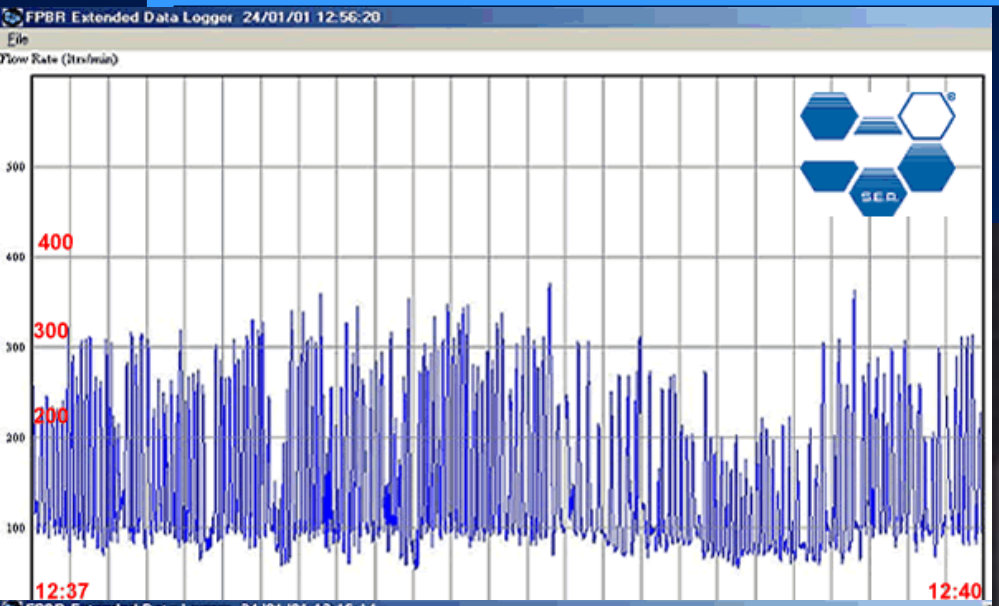
- To decontaminate Personnel in case of Terrorist attack at Sydney Olympic
- To be able to start decontamination within (45 min) in case of an incident
- Including transport, erecting etc.

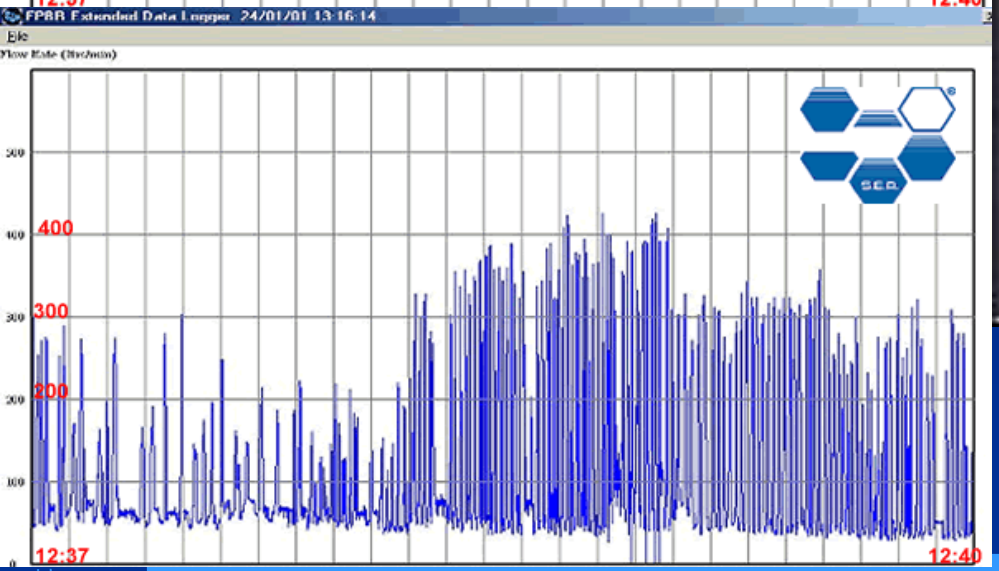
Erecting Tent

Ready for Business

Entering the Building

Loading stretcher


FPBR Extended Data Logger 24/01/01 12:56:20
File
Flow Rate (ltr/min)
400
300
200
12:37
12:40


FPBR Extended Data Logger 24/01/01 13:16:14
File
Flow Rate (ltr/min)
400
300
200
12:37
12:40

Carrying injured person

Decontamination tent

SE-EDL Data Logger

A p p lic a tio n

What consequence does this have?

Is testing SCBA for positive Pressure at 100 Lit/Min = Peak Inhalation 316 Lit/Min sufficient ?

- We should possibly increase the peak Inhalation requirement for SCBA's.

Is testing Particulate filters at constant flow of 85 Lit/Min Sufficient ?

NO!

I suggest we do this in Two steps.

First increase the AIR flow requirement as part of the NEW PAPR standard to better reflect the real requirement.

ALL Filters are velocity dependent

Then revue the 42 CFR 84.

ALL filters are velocity dependent, some filtering material more than others.

Existing standard do not give the filtering efficiency we aspect in real life.

In Testing we have dune with P100/HEPA filters;

@ 95 Lit/Min penetration 0.00138%

@ 250 Lit/Min penetration o.oo476%

This represent approximately tree times higher penetration when we increase velocity by tree.

Does Gas Cartridges testing need a higher Flow Rate ?

- The testing Garry Nelson did at Lawrence Livermore Lab in the 1960-70's are supporting that variable flow rate will NOT significantly influence the capacity!
- But it would not hurt to verify this!

As Samuel “Sandy Berger said

“We would be irresponsible
If we did not take this seriously”

Thanks for your attention

The SEA Group

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