Multifunction Powered Air Purifying Respirators

* Report Summary *

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CBRN Respirator Standards

The findings and conclusions in this presentation have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

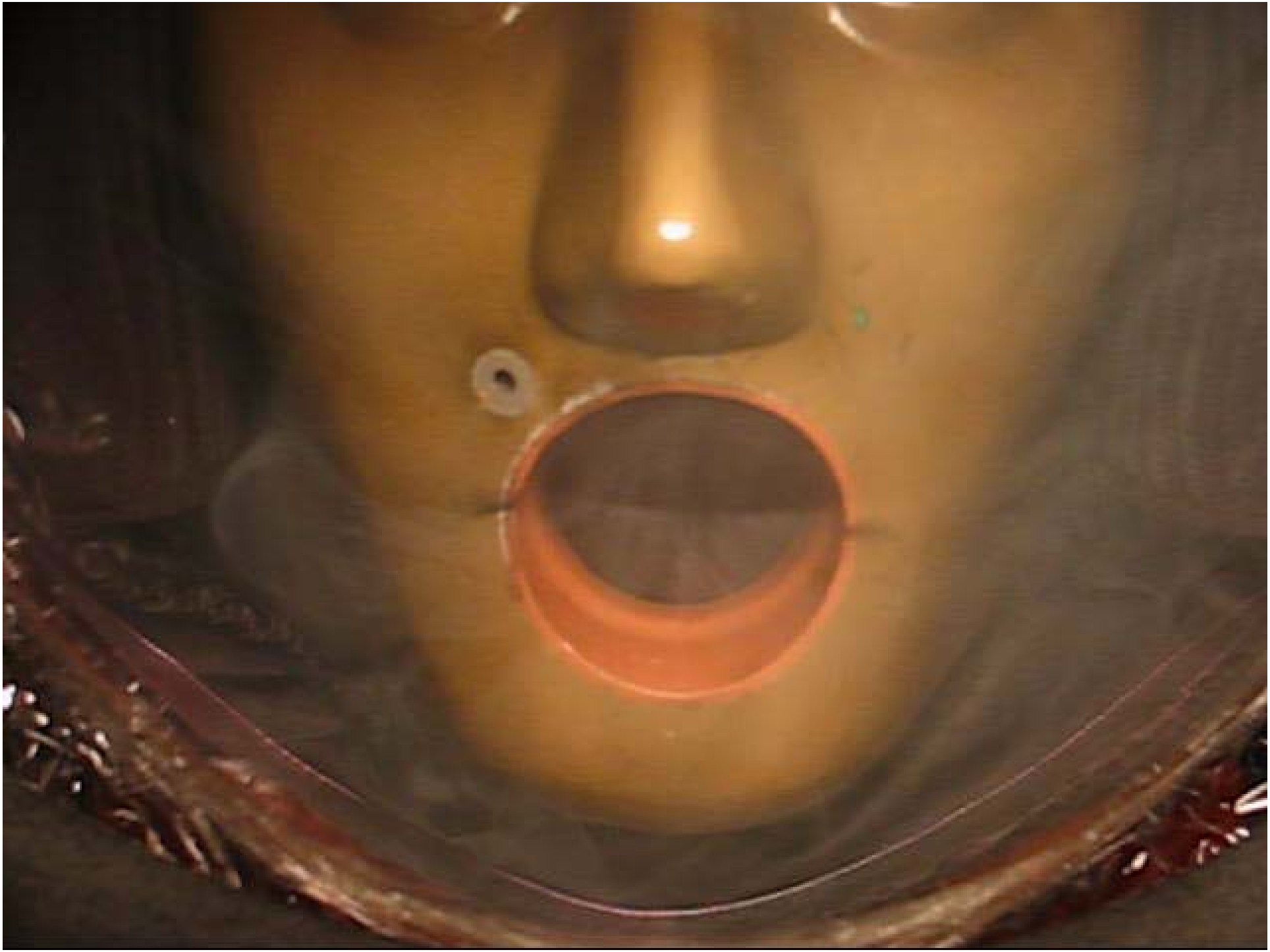
Future Studies

- Identify the leak flow path when inhalation flow > PAPR blower
  - Human testing with incense
  - Breathing machine simulation
- Determine the tidal volume of contaminated air while wearing the PAPR

Current KRUG Steady State

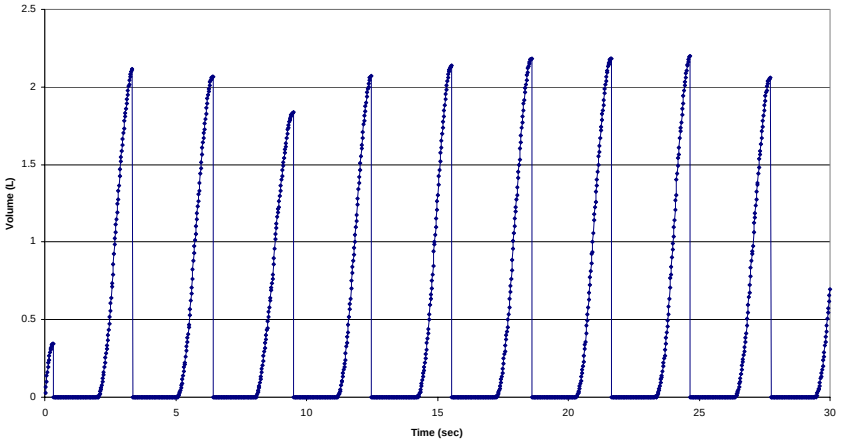
Vacuum flow rate > PAPR blower

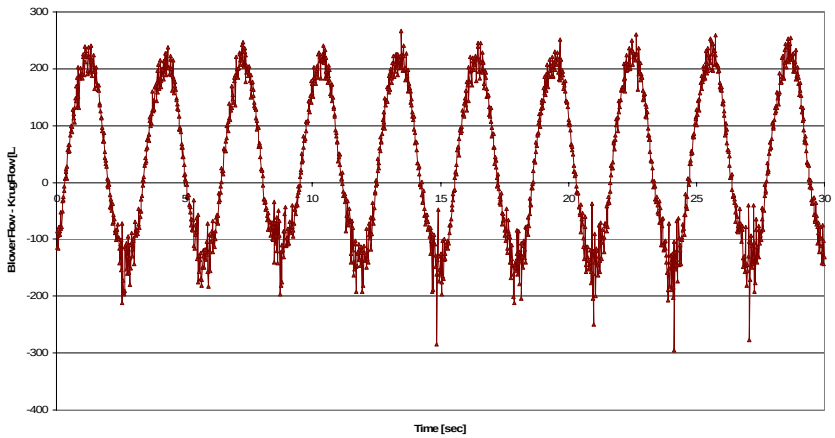
- When PAPR was maxed, flow pathway was too quick to capture.
- But, if the PAPR Blower is slowed, easier to see the flow pathways.



KRUG Breathing

- Net max inhalation rate is about 200 LPM.
- Most of the leak points are between the scarf and lower jaw and around the ears.


Volume (L)
Time (sec)
0
0.5
1
1.5
2
2.5
0
5
10
15
20
25
30


BlowerFlow - KrugFlow[L
Time [sec]
300
200
100
0
-100
-200
-300
-400
0
5
10
15
20
25
30

Future Studies

- CO_2 build up and re-breathed.
- Are the leak flow pathway found during inhalation similar to the pathway of exhaled air?
- If so, the blower intake location may be too close to the exhalation pathway.
- A method to determine the tidal volume of contaminated air while wearing the PAPR.