

Ventilation Monitor

Padraic Casserly, Andrew Dias, Joey Labuz, Joel Webb

Client: John Webster, PhD

Advisor: John Webster, PhD

Last Updated: 3/9/08

Function

We intend to develop a wearable, expandable chest strap to measure and transmit ventilation data to a central command center. This device will be especially useful to monitor the vital signs of firefighters and other first responders in hazardous situations. We hope to deliver a more inexpensive product than current models on the market.

Client Requirements

- Fits under clothing
- Measures respiration
- Real time remote data
- Light, durable material
- Comfortable
- Transmits data

Design Requirements

1. Physical and Operational Characteristics

- a. Performance requirements – withstand daily use, easy to put on
- b. Safety – No exposed wires, no risk of shock/short circuit, no interference with other devices.
- c. Accuracy and Reliability - Should send a signal indicating whether the firefighter is breathing or not.
- d. Life in Service – 5 years
- e. Shelf Life – 5 years
- f. Operating Environment – Must tolerate moisture, temperatures up to 110 degrees Fahrenheit, repeated stretching.
- g. Ergonomics – No slip, minimal rotation, male vs. female form
- h. Size – Variable girth, less than ¼ inch thick, width 4-6 inches
- i. Weight – not more than 1 lb
- j. Materials – knit cotton fabric, Velcro, basic circuit elements.

- k. Aesthetics, Appearance, and Finish – texture should be smooth so as not to irritate skin.

2. Production Characteristics

- a. Quantity of units needed – 1 prototype, but a mass producible design
- b. Target Product Cost – \$100

3. Miscellaneous

- a. Standards and Specifications – N/A
- b. Customer – NONE
- c. Patient Concerns – washable, non-allergenic
- d. Competition – Vivometric VivoResponder (pat #468-6999), PASS (no signal, alarm), Fireeye Heads-up display, Sensetech interwoven fabric, MSA ICM TxR Accountability System