A \$29 Interlock System to prevent Carbon Monoxide Deaths

...built, tested and demo in less than 2 hours.

Kos Galatsis Material Science and Engineering Department, UCLA 6/30/2013 **PROBLEM:** Portable gasoline generators and many CO generating appliances account Carbon Monoxide deaths annually.



<u>SOLUTION:</u> A interlock system can <u>switch off</u> generator engine or furnaces when excessive CO levels are detected, and hence preventing deaths. **OBJECTIVE:** To demo a low cost carbon monoxide interlock system attached and integrated to a portable generator.

PARTS : 1. CO detector (\$25)



Kidde KN-COPP-LPM

S54:49 \$25.03 √Prime Order in the next 25 hours and get i More Buying Choices \$19.75 new (14 offers)

\$16.20 used (3 offers)

2. Electromechanical Relay (\$4)

3. Generator





SainSmart 2-Channel 5V Relay by <u>Sain Store</u> whether (C) (24 customer reviews) List Price: \$12.00 Price: \$5.90 Jordene

You Save: \$6.10 (51%) Special Offers Available

Sold by <u>Sain Store</u> and <u>Fulfilled by Amazo</u> Want it Tuesday, July 2? Order within 25 h 8 new from \$5.85

CONSTRUCTION



METHOD: Obtained alarm signal from CO detector and connected to relay (labor time = 1 hour)

INTEGRATION



METHOD: Connect Relay to On/Off generator switch to enable SWITCH OFF when CO detector triggers (labor time = 0.5 hours)

TESTING & DEMO





Exhaust with pipe redirected to CO monitor Engine Ignition wires connected to CO detector relay



BENCHTOP TEST: Sample of exhaust gas in a bag and placed detectors. Relays switches & works!

PIPE TEST: In 2 minute CO levels increase above 999ppm and generator switched OFF & works!

CONCLUSIONS

1. A low cost \$29 Interlock System built in less than 2 hours can prevent Carbon Monoxide Deaths.

2. Existing off-the-shelf technology exists to built a low cost CO interlock system.

3. Deaths and injuries caused by CO poisoning generated by combustion engines is totally preventable.