

Carbon Monoxide: The High Cost and Affects of Complacency

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Photo by Carey Bilyeu

Scope

- Discuss some of the advantages of performing a thorough examination of boiler rooms to include techniques that could reduce carbon monoxide build-up inside and outside the boiler room proper helping reduce Carbon Monoxide Poisonings.
- This will be attained by discussing past events and preventative techniques within the inspection industry.

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Travel Plans result in tragic deaths



Photo by Todd Creacy

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Stories plentiful of tragic losses and near misses.

- November, 2011, Hotel evacuates 400 guest and staff due to high CO levels, San Francisco, CA
- January, 2012, 1 Death, 16 Poisoned at local hotel, South Charleston, WV
- April 13, 2015, 7 Sickened Employees, 265 Guests Evacuated from Hotel, Peachtree. GA

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The Zurich Services Corporation Fuel Fired Equipment Survey Results - 2014

- 95.5% of properties surveyed showed no signs of improper combustion in the fossil fuel fired equipment.
- 98.5% of the properties surveyed showed ample make-up air for combustion in the equipment rooms
- 97% of the equipment surveyed had exhaust stacks that were intact, sealed, and routed to a safe location.
- 99% of the properties surveyed had access doors that were in good working condition.

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The Zurich Services Corporation Fuel Fired Equipment Survey Results - 2014

- Carbon Monoxide (CO) detection was installed in ONLY 23% of the properties surveyed. Of those properties with CO detection, 8% failed the push button test of the detector.
- 11% of the equipment requiring registration with the governing jurisdiction were not registered
- 17% of the equipment surveyed lacked proper venting of the fuel train components
- 65% of the properties surveyed lacked a properly designed and administered maintenance program for fossil fuel fired equipment. 78% lacked adequate documentation.
- 6% of the properties surveyed had obstructions in the make-up air vents required to support proper combustion.
- 10% of the properties surveyed had combustible material stored in the equipment rooms
- 13% of the equipment surveyed had improper exhaust flues installed.
- Measurable amounts of CO were present at eight (8) properties all with levels less than 50 ppm

Carbon Monoxide Levels and Risks

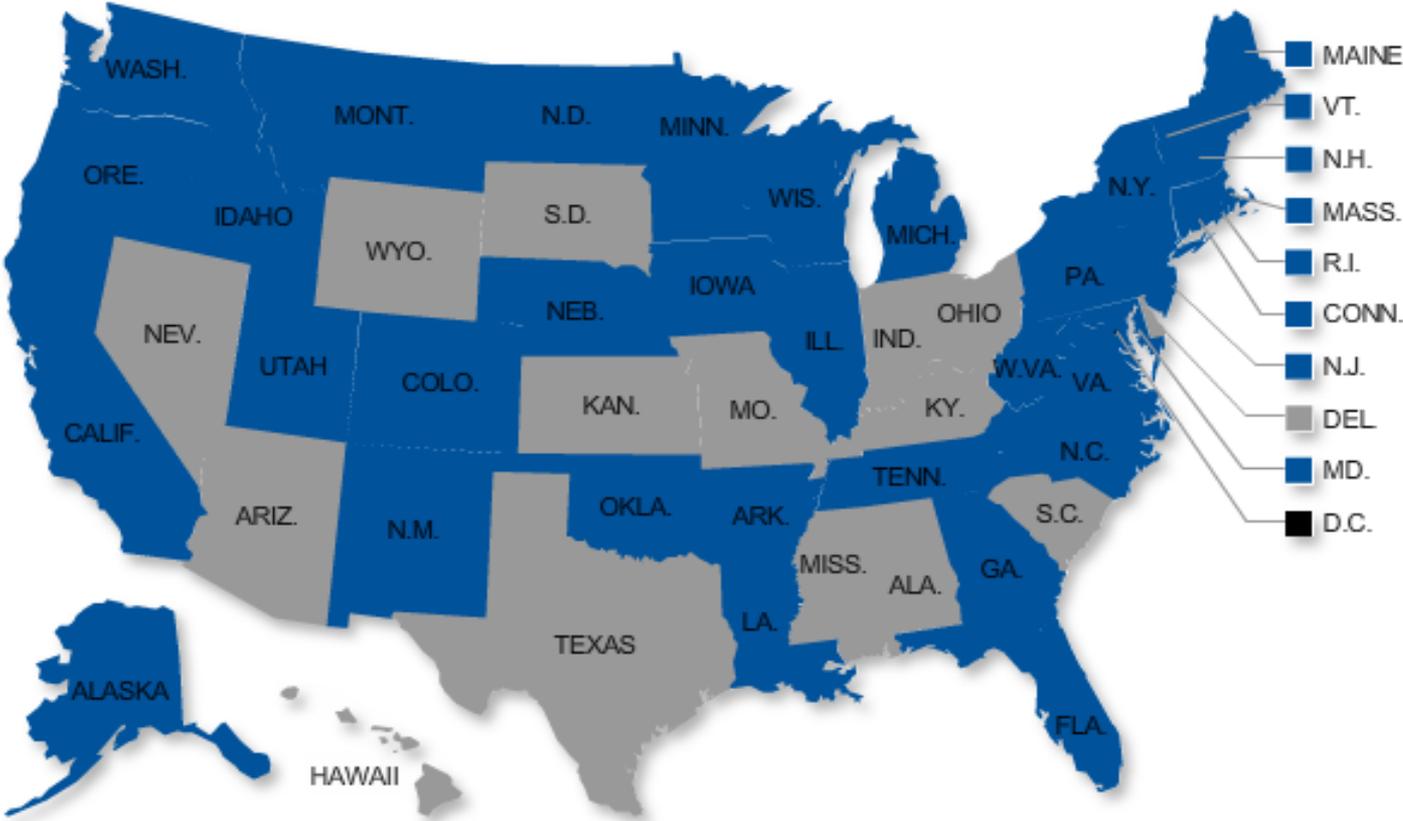
- 1-4 PPM Normal levels in human tissue
- 5-6 PPM Significant Risk of Low Birth Rate if exposed in last trimester
- 35 PPM US NIOSH recommended 8 Hr Maximum Workplace Exposure
Level many Fire Departments wear Breathing Apparatus before entering space
- 50 PPM US OSHA recommended 8 Hour Maximum Workplace Exposure
- 70 PPM First Alarm Level UL Listed CO Detectors

Carbon Monoxide Levels and Risks (continued)

- 400 PPM Healthy Adults will have headaches within 1-2 hours
Life threatening after 3 hours
Both NIOSH and OSHA recommend evacuation of workspace
- 800 PPM Healthy adults will have nausea, dizziness, convulsions
within 45 minutes. Unconscious within 2 hours then
Death.
- 800 PPM+ Death in less than 1 hour
- 3000 PPM Death in less than 30 Minutes

States combat carbon monoxide

Blue states have laws and/or building codes requiring CO alarms in homes.
Gray states have no laws.



Sources: National Conference of State Legislatures and International Code Council
2014

Public Schools

- September, 2014, 145 Students transported to hospital after faulty flue cause of CO Poisoning, Girard, Illinois
- December, 2012, 43 Students, 10 Staff suffer CO Poisoning, Atlanta, GA, Boiler Room Flue leak
- March, 2015, 60 Students, 4 Staff taken to local hospital stricken with CO Poisoning, dead owl caused flue discharge back up, Dallas, TX

Inspector Involvement, Removing the Hazards



- Be Vigilant while in the Machinery Room. Look at more than “just the boiler”
- Look for holes, gaps, shoddy workmanship on Flues
- Familiarize yourself with local building codes (Double Walled vs Single Walled Flue Materials)

Inspector Involvement, Removing the Hazards



- Are there CO Detectors Installed?
- Do they work? Test Them!
- Does the facility have Maintenance Records that are kept up to date?

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Inspector Involvement, Removing the Hazards (continued)

- If the Inspector has access to a CO Detector, take sample readings. Share and Discuss the results!
- Are there signs of improper combustion (Yellow Flames)?
- Are there signs of Excess Carbon buildup with the boiler?

Thank You

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