Carbon Monoxide: The High Cost and Affects of Complacency

April 27, 2015
Carey M. Bilyeu NB-AB

Machinery Breakdown Division
Carbon Monoxide: The High Cost and Affects of Complacency

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.
Carbon Monoxide: The High Cost and Affects of Complacency

Travel Plans result in tragic deaths

Photo by Todd Creacy
Carbon Monoxide: The High Cost and Affects of Complacency

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
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.
Carbon Monoxide: The High Cost and Affects of Complacency
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: The High Cost and Affects of Complacency

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: The High Cost and Affects of Complacency

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
Carbon Monoxide: The High Cost and Affects of Complacency

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
Carbon Monoxide: The High Cost and Affects of Complacency

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
Carbon Monoxide: The High Cost and Affects of Complacency

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)
Carbon Monoxide: The High Cost and Affects of Complacency

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?
Carbon Monoxide: The High Cost and Affects of Complacency

Photo by Carey Bilyeu
Carbon Monoxide: The High Cost and Affects of Complacency

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
The information in this presentation was compiled from sources believed to be reliable for informational purposes only. All sample policies and procedures herein should serve as a guideline, which you can use to create your own policies and procedures. We trust that you will customize these samples to reflect your own operations and believe that these samples may serve as a helpful platform for this endeavor. Any and all information contained herein is not intended to constitute advice (particularly not legal advice). Accordingly, persons requiring advice should consult independent advisors when developing programs and policies. We do not guarantee the accuracy of this information or any results and further assume no liability in connection with this presentation and sample policies and procedures, including any information, methods or safety suggestions contained herein. We undertake no obligation to publicly update or revise any of this information, whether to reflect new information, future developments, events or circumstances or otherwise. Moreover, Zurich reminds you that this cannot be assumed to contain every acceptable safety and compliance procedure or that additional procedures might not be appropriate under the circumstances. The subject matter of this presentation is not tied to any specific insurance product nor will adopting these policies and procedures ensure coverage under any insurance policy.

(c) 2015 The Zurich Services Corporation