Carbon Monoxide Mortality

What are we going to do now?
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In the News

- Woman 72 dies in Gary, Indiana
- Two men found dead in Northside home in Jacksonville, Florida
- Two women in Lindstrom, Minnesota are the latest victims
- Three deaths, an elderly couple and an 11 year old boy die in motel room in Boone, South Carolina
- Two dead and 12 injured in Passaic, New Jersey
- Family of four overcome in Parks, AZ
## CO Alarm Requirements

<table>
<thead>
<tr>
<th>Organization</th>
<th>Period</th>
<th>CO level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASHRAE</td>
<td>8 hrs</td>
<td>9 ppm</td>
<td>from Standard 62.2-2013</td>
</tr>
<tr>
<td>USEPA</td>
<td>8 hrs</td>
<td>9 ppm</td>
<td>NAAQS (outdoor air)</td>
</tr>
<tr>
<td></td>
<td>1 hr</td>
<td>35 ppm</td>
<td>““ “ “</td>
</tr>
<tr>
<td>ACGIH</td>
<td>8 hrs</td>
<td>25 ppm</td>
<td>Threshold Limit Value (*)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>8 hrs</td>
<td>35 ppm</td>
<td>Recommended Exposure Limit (*)</td>
</tr>
<tr>
<td></td>
<td>15 min</td>
<td>200 ppm</td>
<td>Short-term Exp. Limit (*)</td>
</tr>
<tr>
<td>OSHA</td>
<td>8 hrs</td>
<td>50 ppm</td>
<td>Permissible Exp. Limit (*)</td>
</tr>
<tr>
<td>WHO</td>
<td>24 hrs</td>
<td>6 ppm</td>
<td>indoor air</td>
</tr>
<tr>
<td></td>
<td>8 hrs</td>
<td>9 ppm</td>
<td>“ “ “ “</td>
</tr>
<tr>
<td></td>
<td>1 hr</td>
<td>30 ppm</td>
<td>“ “ “ “</td>
</tr>
<tr>
<td></td>
<td>15 min</td>
<td>87 ppm</td>
<td>“ “ “ “</td>
</tr>
</tbody>
</table>

(*) above indicates a standard for an occupational situation
NFPA Reports

Non-Fire Carbon Monoxide Incidents by Year 2003-2010

Center for Disease Control Facts

- Over 5000 Carbon Monoxide (CO) deaths in a 10 year period
- 20,000 visits to the emergency room
- 4000 hospitalized
- Non-fire related
- In only 10% of the deaths investigated CO monitors were present
- In many cases CO monitors were disabled or the alarms were misunderstood
Locations with Inspector Alarm Activation

- Food Processing Facility – Southern Zone – October 9, 2017
- Church – Massachusetts – November, 2017
- Nursing Home – Minnesota – December 14, 2017
- National Guard Barracks – Maryland – December, 2017
- Nursing Home – New York – January, 10 2018
- Hospital – January, 2018
- Bank – New York – January 31, 2018
- Supermarket – New Jersey – February 1, 2018
- Medical Tubing Manufacturer – Maryland – February 12, 2018
- Food Processing – Southern Zone – February, 2018
- Nursing Home – New Jersey – February 21, 2018
- Apartment Building – New Jersey – February 26, 2018
At What Cost?

• Approximately 6600 individuals are estimated to sustain long-term cognitive sequela annually
  • Total loss in earnings of approximately $925 million
• 334 individuals die from accidental, non-fire related CO poisoning
  • Average loss of 26 years of productivity accounting for $355 million
  • 2800 are hospitalized with acute medical care costs of $33 million
• Available data indicate that accidental CO poisoning in the US conservatively costs society over $1.3 billion, resulting from direct hospital costs and lost earnings
• Recent settlements suggest if you inspected a room with an object involved in a CO incident you will be named in lawsuit
  • Average cost to defend exceed $250,000
  • Settlements vary, averages exceed $1M

Source: Cost of accidental carbon monoxide poisoning: A preventable expense, Neil B. Hampson, Science Direct, https://doi.org/10.1016/j.pmedr.2015.11.010
What Can We Do?

• Insist on regular maintenance
• Insist on regular flue and combustion air vents/damper inspections
• Increase awareness at the inspector level
• Support initiatives to get detection
What Can We Do?

• Educate clients on the dangers and cost associated with CO

• Insist that inspections include the boiler flue connections!
Areas of Focus

- Equipment user training
- Change management
- Transfer of knowledge
- Detection
- Verify detection!
- Personnel detection devices for inspectors
What Will It Take?

• Inaction = irrelevancy
• Train your staff
• QC should include flue and combustion air inlets
• Support regulatory changes
• Ask for CO monitors
Questions?

Here's the Safe Way to Connect Heating Equipment to the Chimney

- Safety Thimble
- Gas Line
- Clean Vent Pipe, Snug-Fitting & Uphill
- Gas Shut-Off
- Flame, Not Too High

NEVER use a generator indoors, in garages, or carports.

ONLY use outdoors and far from open windows, doors, and vents.
Thank You

Vincent Scarcella
Vincent.Scarcella@CNA.com