

Carbon Monoxide Cases Investigated

by Thomas L. Liston, P.E., Mechanical Engineer

Case: A young woman in her mountain cabin was found dead of carbon monoxide created by a propane-fired refrigerator which was vented to indoors. 2009.

Case: A young couple and their 3 children experienced carbon monoxide in their rented suburban single-family residence which was heated by a conventional up-flow gas-fired furnace located in a closet. Furnace was replaced and lost prior to inspection by other than the PG&E serviceman who measured high levels of carbon monoxide. Route traveled by CO was never identified.

Case: Three occupants of a rented apartment in Berkeley went to the hospital with CO poisoning. PG&E found clogged flue spilled 3,000+ ppm from wall heater. Room was measured at 240 ppm upon arrival.

Case: A young man living in a second-floor apartment in Culver City, California was injured by carbon monoxide coming from a Holly Mfg. Co. Model 35NS-ND 35,000 Btuh wall heater, double-sided. 66,600 ppm of CO were measured in the flue. Two causes were found. First, lack of maintenance permitted a build-up of dust and dirt in the burner's venturi. Second, the highest joint in the double-wall flue was disconnected, The final section was twisted about 45 degrees away from the lower section, allowing most of the products of combustion to spill into the attic.

Client: Bailey & Partners of Santa Monica, California

Side: Plaintiff. 2012

Outcome: Apartment owner settled.

Case: A young couple and their three children were hit by carbon monoxide in their rented house in Napa, California on 12-07-2010. PG&E found heater's flame recirculating. Heater was Williams Model 2509612, but it was grotesquely modified. The burner was twisted to a non-horizontal, inward-facing direction. The control valve was an incompatible type meant for former Williams models having no provisions for connecting a spill switch. The spill switch was disconnected by snipping of wiring. Former home owner swears it came out of the box that way. It seems that three generations of former owner's family lived for at least a decade with that heater and did suffer accordingly.

Client: Julia Swanson Law Office of Beverly Hills, California

Side: Plaintiff. 2012.

Outcome: Manufacturer settled.

Case: A young woman was hit by carbon monoxide in her small apartment in Calistoga. PG&E measured 3,500 ppm in her Williams Model 256VA wall heater flue and measured 100 ppm in front of heater after five minutes of operation.

Client: Julia Swanson Law Firm of Beverly Hills, California.

Side: Plaintiff. 2012

Outcome: Unbelievably, jury did not believe the event had happened!

Case: A young woman visited the ER complaining of symptoms of carbon monoxide. Neither she nor the ER doctor realized carbon monoxide was indicated. ER sent her home with a diagnosis of flue. That night, she and her boyfriend were hit hard by carbon monoxide in their just-moved-into apartment. She survived with serious long term injuries. He, 25 years old, survived but will require 24-hour care for the rest of his life. Cause: An improperly maintained 55-year old (or older) Royal wall heater.

Client: David Fulton, Esq. of Cartwright, Scruggs, Fulton & Walther of Santa Cruz, California.

Side: Plaintiff. 2012

Outcome: Very satisfactory settlement for injured parties.

Case: A young woman living in a very nice upscale apartment complex heated by wall furnaces was injured by carbon monoxide. Complex was about 30 years old, as were the furnaces. Complex had a history of zero maintenance, repair-only, of heaters. Inspection found flue caps to be too low, violating code.

Client: Bailey & Partners of Santa Monica, California

Side: Plaintiff. 2011

Case: Couple who had been living in their same mobile home for many years called a service contractor to replace a faulty thermostat for their furnace. Contractor replaced thermostat and then tested for carbon monoxide and found none. The next morning, husband and wife were hit with carbon monoxide, barely escaping with their lives. Examination showed that furnace worked properly when blower was at slow speed but dumped 200 ppm of CO into delivered air stream when operated with fan "on", which was a higher speed.

Client: John Houts, Esq. of San Diego.

Side: Plaintiff. 2011

Case: Middle aged woman complained of carbon monoxide symptoms over an eight year period in her small, rented home. She believed the source was her hot water heater which had been replaced three times. History showed first heater was replaced due to a water leak. Second heater was replaced because gas company red-tagged it due to its flame being improper and it was found to be a propane heater using natural gas. Third heater was found to be O.K. Inspection found room was too small, room had no combustions air openings, flue cap was incorrect type, flue cap was too low. Test showed carbon monoxide build-up when fired. Case settled favorably for victim.

Client: Shane & Taitz of Greenbrae, California

Side: Plaintiff. 2010

Case: 5-8-2010 Woman died of CO poisoning caused by a propane fired refrigerator which had not been maintained properly in Folsom, California.

Client: Flesher Broomand McKague LLP

Side: Defense

Case: Young woman died of carbon monoxide in her sleep in living quarters located over a boiler room. The room housed two Laars & Jandy Model EHE350NB pool heaters, one of which was found creating massive carbon monoxide.

Client: Walkup, Melodia, Kelly & Schoenberger of San Francisco attn: Doris Cheng, Partner

Side: Plaintiff. 2009

Case: Young couple experienced brain damage from carbon monoxide created by wood stove. Found that stove's catalytic combustor was clogged and damper for bypassing the combustor was shut.

Side: Plaintiff. 2009

Case: Woman experienced brain damage from non-maintained floor furnace. Found bottom of flue missing. Found flue from furnace to outdoors rotted through and resting on crawl space ground. Found heater controls misbehaving.

Side: Plaintiff. 2007

Case: Young woman died of carbon monoxide in her sleep in an apartment building in LaHabra, California. Natural-gas fired wall heater was found to have been improperly assembled during amateur repair. Consequently, carbon monoxide was created and not vented. The only interesting aspect of this investigation is that no harm had manifested earlier

Client: Sempra Energy Law Dept. (for Southern California Gas)

Side: Defense. . 2007.

Case: Entire family of about 8 people was poisoned in their up-scale Manhattan Beach home by their Laars & Jandy Model EHE350NB pool heater. The problem was identical to that which caused the death described in the following case. I had warned Jandy Pool Products of this defect in their product almost a year earlier. The "fix" needed is utterly simple, yet Jandy has done nothing.
Client: Jean Paul Wardy (victim) of Center Call Properties, El Segundo, Calif.
Side: Plaintiff. 2007.

Case: Young woman was injured by carbon monoxide while living in a very small (256 sf) cottage. Questions was, "Which was the source: Hot water heater in a small enclosure having no combustion air vents? or a gas range pilot light having a CO measurement of 135 ppm 3 feet above the flame?" P.G. & E. measured CO both at the stove and in the water heater enclosure. Then the structure and components were destroyed before I was engaged. My modeling calculations showed that either source could have been responsible.
Client: Paul Van Der Walde of Sunnyvale, Ca.
Side: Plaintiff 2007

Case: Furnace in single story ranch home created heavy carbon monoxide which entered home, causing severe brain damage to 5-year old boy.
Results of Investigation: Two causes were found. First, faulty gas valve in furnace allowed gas pressure to be un-regulated, resulting in over-firing and consequent creation of carbon monoxide. Second, a defect in flue located within blower suction compartment of Amana Model GC1C090CX50 downflow furnace allowed carbon monoxide to enter home. Problem with White-Rodgers Model 36E22-203 gas valve was found to have improper factory-installed springs which led to a tendency to hang up wide open.
Client: Beyer, Pongratz & Rosen of Sacramento, attn: Erik Child, Esq.
Side: Plaintiff. 2004

Case: Husband and wife in up-scale mountain vacation home in Idaho were seriously poisoned (but survived) by carbon monoxide generated by the home's high-efficiency water heating/space heating unit.
Results of Investigation: General contractor had retrofitted exhaust flue incorrectly, causing flue to be blocked by trapped condensate. Carbon monoxide sensing system had been set to increasingly higher set points to avoid listening to alarm.
Client: Ringert Clark Chartered Layers of Boise, Idaho, attn: David Claiborne
Side: Defense of installing contractor. 2004.

Case: Stanford star badly damaged by a wall furnace in rented San Francisco apartment.

Results of Investigation: Blockage within heat exchanger caused flame roll-out, creation of carbon monoxide, and spillage to occupied space. Control valve was found erratic, sometimes causing over-firing and flame roll-out during tests even when blockage was removed.

Client: Law office of Linda Ross of San Francisco & Law Offices of Bennett, Johnson & Galler of Oakland.

Side: Plaintiff. 2003 thru 2008

Case: A 25 year old bachelor from Korea living in a one-story two-bedroom rental house in Los Angeles died in his sleep from an un-vented 32-year old gas-fired wall heater.

Results of Investigation: Broken ceramic piece created improper combustion, resulting in carbon monoxide creation. Surprise was that bedroom window was wide open yet death resulted anyway.

Client: Carol Knoblow, Esq. of Nelsen, Thompson, Pegue & Thornton of Santa Monica.

Side: Defense of home owner. 2003

Case: Javier Macias/Rosalba Garcia vs. Mission Bell Motel, Ventura.

A young man living in a motel having a gas-fired wall heater died of carbon monoxide poisoning, presumed to have been caused by a clogged flue.

Results of Investigation: Victim had often written and drawn figures in the soot on the ceiling.

Client: Russ Wollman, Esq. of Murchison & Cumming of Los Angeles.

Side: Defense of motel. June 2003.

Case: A husband, wife and wife's mother were in an apartment in a two-story apartment building in San Leandro. The apartment was immediately over a boiler room. The husband died; wife and mother survived. Wife had complained weeks earlier. Gas company had then red-tagged for two problems: a blockage within heat exchanger and a leaking stem of the gas shut-off valve. Repair contractor fixed valve but ignored blocked heat exchanger. Contractor did not hold correct license.

Results of Investigation: Settled for \$2,550,000.

Client: Frank S. Moore, Esq. of Moore Law Office, San Francisco

Side: Plaintiff. 2003/2004

Case: A young, newly married and pregnant couple living in a two-story apartment building in Panorama City were hit by carbon monoxide from their 30+ year old gas-fired wall heater. The wife had visited her doctor, complaining of headaches; but the diagnosis of carbon monoxide was missed. The couple went to sleep watching TV. The wife never awoke.

Results of Investigation: Multiple gas company men and at least one private serviceman visited the scene and did whatever they did. Their reports and my observations and tests could never be reconciled. The reason for the creation of carbon monoxide was never identified. A firing rate twice what I measured was reported by the gas company man. The rate I measured was only 67% of what the nameplate had. The flame appeared normal to me (and to other experts). A problem with the flue was initially reported, but even when I totally blocked the flue, the heater would not generate CO.

Client: Marlin Howes, Esq, of Sempra Energy Law Department

Side: Defense of Southern California Gas Company. 2003

Case: Two women staying in a 30-year old beach resort motel heated with gas-fired wall heaters were poisoned by carbon monoxide, as verified by hospital blood tests. They survived.

Results of Investigation: Improper flue and tight construction features combined to starve heater, resulting in carbon monoxide creation. Heavy soot in flue confirmed diagnosis. Flue top was not an approved type. Height of flue cap above roof was inadequate. Height of flue above heater was inadequate. It is and was interesting that the same condition prevailed in about 15 other like motel rooms, all since initial construction, with this being the first time the problem was identified.

Client: Darlene M. Ball of Borton, Petrini & Conron, LLP of San Luis Obispo

Side: Defense of motel owner. 2002

Case: 22 vacationers in an up-scale rental house at Zephyr Cove, Lake Tahoe, Nevada were hospitalized from carbon monoxide created by a Lennox high efficiency furnace located in a basement/crawl space.

Results of Investigation: Flue was blocked by dead birds. Serviceman repeatedly replaced warning device rather than remove birds. Flue repair using electrical tape rather than PVC coupling allowed products of combustion to spill into crawl space. CO then migrated to entire house.

Client: Tom Beko of Erickson, Thorpe et al of Reno.

Side: Defense of house owner. 2000

Case: A sailor, his wife and three children were hit by CO in their Navy Housing at NAS Meridian, Mississippi. All died except the mother, who barely survived. Gas fired furnace was initially presumed to be source. Previous CO exposures had happened in the same type of houses at the base in years past; all in-depth investigations came up empty of explanations.

Results of Investigation: I am of the opinion that an idling automobile in an adjacent carport was the far more likely source of CO than was the furnace.

Client: Tim Moore of Currie, Johnson et al of Jackson, Mississippi.

Side: Defense of HVAC maintenance contractor. 2000.

Case: Baby with severe birth defects as a result of CO poison.

Results of Investigation: Riverside tract home had flue problems for hot water heater &/or with gas clothes drier. Liston consulted only as to likelihoods.

Client: Friedenthal, Cox & Heskovitz, LLP of South Pasadena, attn Dan Friedenthal. 2000

Case: Two young girls from India were overcome by CO in their Berkeley apartment, which was heated by a wall furnace. One died. Feb. 2000

Results of investigation: Heater flue was blocked by re-roofing debris, and flue had been re-installed criminally by roofer. Girls operated heater with all windows shut.

Client: Todd Jones, Esq, of Archer Norris of Walnut Creek.

Side: Defense of prior owner. 2000

Case: Young couple in small rented cabin in Santa Cruz Mountains was found overcome by carbon monoxide after being unconscious for several days. They spent several more days unconscious in hyperbaric chambers in Monterey.

Amazingly, they appear to be none-the-worse for their experience today!

Results of Investigation: Propane fired wall heater, hot water heater, stovetop, oven and refrigerator all checked out blameless. I was stumped. I took the refrigerator to my facility and tested it for days but found it to be working perfectly. Then homeowner's wife then spotted a propane refrigerator recall in local paper. I confirmed with Servel Company that they were recalling all Servel propane refrigerators manufactured between 1933 and 1957 because of 13 confirmed deaths there from. The subject refrigerator was one of them.

Client: Timothy Volkmann of Law Firm of Gasset, Perry & Frank of Santa Cruz. 1997

Case: Young couple and three children were nearly overcome by carbon monoxide in their rented apartment in San Jose. Barely conscious father was able to identify problem and save family. Source of CO was double-outlet gas-fired wall heater, Narrowall Model 50D by Holly General, a division of Siegler Corp. Cause of CO was a dirty burner &/or an obstructed venturi.

Client: Veronica Rendon of Murphy, Pearson, et al of San Francisco. 1997.

Case: One adult died; two adults and two children survived several days of CO poison before being discovered in apartment in Milpitas served by a natural gas-fired wall heater.

Results of Investigation: Wall heater's burner was clogged with debris, causing carbon monoxide to form. The combined system of house/burner/flue was unable to remove products of (incomplete) combustion.

Client: Russell A. Robinson, Esq, of Law Office of Richard Werthimer of S.F. 1996

Case: Up-scale couple had just bought small, older cabin at Big Bear Lake. When they failed to appear for work on Monday, co-workers called real estate agent. Agent went to house, saw couple on floor, and broke in, saving the wife's life but not the husband's. Miraculously, wife appears to be O.K. even though unconscious for days!

Results of Investigation: Wall heater heat exchanger was found to be badly clogged with soot. Flue was found to work well with open window but was found to reverse flow when windows were shut and fire was in fireplace. Clogged heat exchanger was verified to create CO, and reversal of flow in flue due to fire in fireplace was shown to put CO into living space.

Client: Scott Houtz, Esq. of Law Office of David H. Greenberg of Beverly Hills 1996.

Case: Elderly couple, tenants in S.F. Housing Authority apartment, died of carbon monoxide poison.

Results of Investigation: Couple used stovetop burners to heat apartment, killing themselves. Need for unorthodox heat was found to be due to clogged hot water baseboard heaters. Clogging was due to debris and lack of maintenance.

Client: Jacob Burland, Esquire 1995

Case: Nurse in medical doctor's office claimed that her unborn child was brain damaged due to carbon monoxide from rooftop air conditioning unit.

Results of Investigation: History of service verified that rooftop "gas-pack" type air conditioner adjacent to unit serving space created carbon monoxide. Study of heat spots, of service clean-out, of improper filter arrangement, and of prior fresh air intake indicated that either the carbon monoxide of the adjacent unit and/or the discharge from dentists' vacuum unit could have been blown into space occupied by nurse.

Client: Eugene A. Brodsky, Esq. of Miller, Brodsky & Baskin of S.F. 1995

Case: Wife died but husband survived unharmed when overcome by CO in small rented house in San Francisco.

Results of Investigation: Natural gas wall heater had been improperly overhauled by landlord. Heat exchanger slipped out of correct position, resulting in inadequate venting.

Client: Michael C. Miller, Esquire. 1994

Case: TV station executive almost died from carbon monoxide in his small, rented older house in San Jose.

Results of Investigation: Found that flue serving small, floor-standing living room heater was missing the bottom of outdoor tee. Cause became evident in the first 10 minutes of investigation, being almost identical to cause of Besag death (described below). It stood the hair on my neck straight up!

Client: Karin A. Poire, Esq. of Sedgwick, Deter, Moran & Arnold of San Francisco. Feb. 1993.

Case: Peter Besag, PhD, died from carbon monoxide in his 3-story studio apartment. His girl friend was hospitalized but survived. A month or so later, his brother almost died in the same place from the same cause.

Results of Investigation: Found that flue serving propane furnace and hot water heater was missing a plug from the bottom of a tee. Illustrated cause and effect by firing system with canary in living quarters. Canary died.

Client: Jacques Adler, Esq., of San Francisco. 1992

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